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OCCUPATIONAL OUTLOOK

by DAVID I. VERWAY, *Research Professor, Division of Research, Graduate School of Business Administration, Michigan State University*

According to the new special supplement to *Occupations in Demand at Job Service Offices*, a publication of the U. S. Employment Service of the Department of Labor, there were four electronics engineering jobs available in the aerospace industry in Michigan during August. The jobs were located in Grand Rapids, Lansing, and Saginaw. Four tool designers (aerospace) were sought by employers in Detroit, one in Kalamazoo. Aerospace positions also were open for a cost-analysis engineer, an electronic design engineer, an electrical design engineer, and an electrical test engineer, all in Detroit.

Nonaerospace openings in the Detroit area included jobs as cash clerks, insurance salesmen, commercial cleaners, security guards, cannery workers, construction workers, and building maintenance repairers. No other openings were listed for the Wolverine State.

Other evidence of slim pickings this year for Michigan youth is found in *Quarterly Job Openings Report*, published by the Michigan Employment Security Commission. Most blue-collar factory, construction labor, and other entry level occupations for the unskilled are listed as surplus. Shortage occupations include nurse, physician, medical laboratory technician, clinical psychologist, and several categories outside medicine for which long training also is required (see Table 1). The poor market for young unskilled workers and favorable prospects for those with college degrees are responsible for enrollment in Michigan colleges being higher than expected this year. The college bound should be selective, however. Teaching, pharmacy, law, writing, and various managerial specialties are experiencing labor surpluses.

SHORT-TERM OUTLOOK

Manufacturing employment in this state is not expected to recover to the 1978 level until 1983. Construction employment could recover during 1982, depending on interest rates and the availability of money. At the other extreme, service industries have not stopped growing, although there has been some slowdown in the rate of gain.

For those seeking high paying jobs in construction and manufacturing, there will be too few openings this year and next to satisfy those already unemployed, let alone meet the needs of those new in the labor force. It may seem paradoxical that jobs will be plentiful in retail trade and the lodgings industry. These sectors depend on the general level of income, which will improve substantially here (despite slow growth in manufacturing employment) because of rapidly rising paychecks. Typically, factories increase overtime work more rapidly than employment during the early stages of economic recovery.

The weak condition of the state treasury is projected to last for several quarters; among other reasons, the 1978 Headley Amendment to the Michigan Constitution precludes a significant increase in revenue. The tight budget translates into layoffs in state and local government, including higher education. The effect will be most pronounced on clerical and secretarial occupations. Nonetheless, there should be plentiful opportunities for men and women with these skills, particularly in southeastern Michigan and the Grand Rapids, Kalamazoo, and Traverse City areas.

The MEDIC Program, by Wayne L. Workman / page 3

BEST AVAILABLE COPY

Comprehensive analysis of the outlook for Michigan college graduates is impossible because separate occupational data are not available for each level of educational accomplishment. College placement officers are in a position to gauge the market in a general way. The latest Michigan State University Placement Services Annual Report, for example, had these comments about the latest academic year:

> The number of graduates in the College of Agriculture and Natural Resources was up from 1978–79, but employer interviewing requests declined somewhat. Packaging remains highest in demand, with Food Systems Economics and Management second, and Crop and Soil Science third. Job listings for agriculture and natural resources alumni remained about the same as last year.
>
> Campus interviewing opportunities for College of Arts and Letters students were up 3 percent from 1978–79. The number of schedules was higher at the Master's and Doctoral level, and lower at the Bachelor's. Of job vacancies posted at Placement, the largest number of requests were for Art, Music, and English.
>
> The demand for MBA's from the College of Business climbed 5 percent, yet employer requests for B.A.'s dropped 13 percent from last year. The increase in demand for MBA's was most apparent for Financial Administration. At the Bachelor's level, no single major took all the drop. Accounting is most attractive to employers. The Alumni System showed a slight decline in business listings.
>
> Graduates from the College of Communication Arts and Sciences had approximately the same number of opportunities to interview on campus as last year. The total, however, remains low as employers in this area tend to hire graduates on a mail-in and walk-in basis. Advertising was the most frequently requested degree at both Bachelor's and Master's levels. Requests for Bachelor's and Master's in Journalism more than doubled. Journalism was also the college's most frequently designated degree through the alumni job listing service.
>
> The supply of new teachers in Michigan is falling faster than the demand for College of Education graduates, although the job market for teachers this year will be temporarily softened by current economic conditions. Certain fields are demanded such as math, science, vocational education, industrial arts and special education. Other majors are oversupplied such as elementary education, social sciences and foreign languages. Regardless of new teacher availability, rural and inner city school districts often find it difficult to obtain teachers. School districts can no longer be as selective when hiring teacher candidates since only 6,400 new teachers were available for 3,427 positions filled by new teachers in 1979–80 (1.5 to 1). This compares to 23,000 new teachers available in 1969–70 for 7,700 vacancies in 1970–71 (3 to 1).
>
> 1979–80 seemed to bring a deepening of recession for many Ph.D. candidates seeking academic positions. Listings declined, hiring slowed, temporary non-tenure positions became more common. Employers became more demanding and specific in their requirements. However, most business areas were in high demand; candidates in special education were able to be selective. Nursing, some agricultural areas, and Human Ecology were also high demand areas.
>
> In the school administration division, there were about the same number of job listings as before. The greatest change was in the decreasing number of candidates.
>
> It was a very good year for graduates of the College of Engineering. B.S. mechanical engineers continued to have the largest number of interview requests from employers for the entire University. Electrical Engineering and Computer Science followed. Alumni vacancies listed for engineers rose slightly. Chemical engineers received the highest salary offers, followed by electrical engineers. Computer science starting salaries rose the most.
>
> The number of campus interview possibilities at the Master's level for the College of Human Ecology showed a very good increase over 1978–79. Total requests for Bachelor's degrees improved slightly. Moreover, both numbers have risen significantly since five years ago. Retailing, in the highest demand in the college at both degree levels, improved but slightly for undergraduates, but showed a good increase at the graduate level. The most dramatic increase, however, came at both levels, particularly Master's, for Clothing and Textiles. A slightly smaller number of alumni job vacancies occurred in 1979–80.
>
> Employer requests for James Madison College majors improved this year. However, limited interviewing opportunities and minimal job listings continue to be a frustration to Madison students as well as other liberal arts majors.
>
> Graduates of the College of Natural Science and Lyman Briggs found demand about the same as last year as measured by the number of campus interviewing schedules. Chemistry majors had the largest number of requests, followed by Mathematics. There was a good demand for Physics majors. The alumni vacancy service had 6 percent fewer listings for this college.
>
> Jobs remain plentiful in the medical and health services fields although the employment situation is changing slowly. Supply and demand are coming closer together. Shortages of physicians continue to exist, but one federal study concludes that a surplus may exist by 1990. There is a problem of specialty maldistribution and geographic balance. A better overall balance of supply and demand exists for veterinarians in private practice, but some shortages exist in the educational area. Industrial demand is not being fully met.
>
> Interviewing schedules for graduate students in the College of Social Science increased; those for undergraduates remained the same. Requests for the Bachelor's Multidisciplinary Program rose, however. Demand for Master's of Labor and Industrial Relations continued to increase. Alumni job listings were the highest for Mental Health, Urban Planning, Psychology and Master's in Social Work.
>
> With a limited number of graduates, the College of Urban Development finds its students must seek employment through sources other than Placement Services. Eighty-four percent of the 1978–79 class was placed within six months of graduation.

Discussions with and reports from several other placement

(Continued on page 5)

THE MEDIC PROGRAM

by WAYNE L. WORKMAN, *Director, Office of Economic Development, Michigan Department of Commerce*

Communities throughout the state vary considerably in the availability and cost of such business location factors as land, buildings, transportation, energy, labor, and wastewater treatment. They have limited control over most of these, but within these limits may rest the particular combination that a business wants. Some communities in Michigan have compiled impressive records in successfully locating and expanding industry within their boundaries, while others have had little or no success.

In many cases, the differences in success are attributable not only to cheaper resources but also to a superior job of preparing a realistic strategy for economic action based on available resources, organizing economic development efforts, and making an effective presentation to prospective business. The fundamental feature exhibited in successful communities is the cooperation of public and private sectors and a recognition of the value of organized community action in avoiding needless costs, unnecessary delays, conflicting activities, and duplication of effort.

THE MEDIC PRINCIPLE

The Michigan Economic Development Incentive Concept (MEDIC) is a state assistance program administered by the Office of Economic Development (OED), Michigan Department of Commerce, to promote local economic development. It was established to carry out state and local economic development goals and strategies by helping communities improve their ability to develop and implement economic development programs.

The primary role of the state in the MEDIC program is to function as a catalyst to encourage the creation of umbrella organizations, generally at the county level, that can unify and strengthen existing development efforts or establish a comprehensive economic development structure where none previously existed. The umbrella organization for a community should serve as the lead organization and be responsible for implementing the development program. To that end, the state will provide financial, technical, and management assistance, as well as program coordination for those communities that apply for participation and are designated as MEDIC communities.

Since the initiation of the MEDIC program in 1976 with the funding of local economic development organizations in Chippewa County, Genesee County, and Detroit, the program has been expanded to include fifteen additional organizations.

The program is flexible in the type and nature of assistance provided to communities. In addition to funding economic development organizations directly, the program will fund technical assistance projects that will support or reinforce economic development efforts. For example, a grant was made to the Institute of Science and Technology at the University of Michigan to conduct a series of economic development practitioner training programs. Because of new state and federal economic development programs, the demand for trained practitioners exceeds the supply. Training of persons entering the economic development field in the skills and knowledge required of full-time practitioners will increase the effectiveness of local economic development organizations.

NEW JOB IMPACT

The existence of substantial and persistent unemployment in Michigan is due to both structural and cyclical factors and is not limited to a few communities in the state. The problem is one that affects virtually every one of Michigan's eighty-three counties, each having particular economic problems and opportunities.

The overall goal of the MEDIC program is to create permanent base industry job opportunities in the state. At the time the MEDIC program was designed it was anticipated that the number of jobs created during the first twelve to eighteen months of an organization's operations would be minimal. It was anticipated that significant job creation would occur after this start-up period. It was further expected that there would be variation in results among communities, depending on the level of pre-MEDIC activity and on existing economic development resources.

The job creation performance of the local development organizations has met the expectations of the Office of Economic Development and confirmed previous estimates of the lead time required. The organizations that have operated programs for two years or longer are showing significant results in the creation and retention of jobs. Organizations that have been staffed for six to eighteen months are beginning to show results. The newest development groups have not developed adequate community infrastructure to recruit industrial growth. During the 1979–1980 year at least 3,158 jobs were created and retained by these organizations.

BRIEF

Production of Michigan apples this season is set at 900 million pounds, a 32 percent increase over last year. This would be the second largest apple harvest in Michigan this century, just 20 million pounds short of the record established in 1978.

Reversing the trend of last year, all major varieties are expected to post production increases except Northern Spies, which are expected to decline 14 percent. Last year Northern Spies were the only apple variety to increase. Leading this season's production increases is Red Delicious, up 76 million pounds over last fall to 185 million pounds this season. Jonathans remain the largest variety produced in Michigan, with a 220 million pound harvest forecast. The only other variety exceeding the 100 million pound mark is McIntosh, pegged at 150 million pounds.

At the national level, the August 1 apple crop forecast is placed at a record 8.36 billion pounds, up 3 percent from last year's record crop and 10 percent above the 1978 crop.

Delicious continues to rank as the leading apple variety and is expected to account for 37 percent of total production. Other leading varieties and their expected 1980 production are: Golden Delicious, 16 percent; McIntosh, 9 percent; Rome Beauty, 7 percent; Jonathan, 5 percent; and York Imperial, 4 percent. These six leading varieties collectively account for about 80 percent of the forecast production.

The MICHIGAN STATE ECONOMIC RECORD

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Michigan Economic Indicators

Item	Year previous of latest month	Previous month	Latest month
Manufacturing workers:			
Average weekly hours, Michigan	40.5	39.6	39.6 (Aug.)
Average weekly hours, U.S.	40.0	38.9	39.5 (Aug.)
Average hourly earnings, Michigan ($)	8.66	9.43	9.34 (Aug.)
Average hourly earnings, U.S. ($)	6.70	7.29	7.31 (Aug.)
U.S. motor vehicle production (units)	805,186	395,957	664,371 (Sept.)
Michigan electricity usage (mil. kwh.)	5,870	5,698	5,086 (May)
Industrial (mil. kwh.)	2,873	2,453	2,162 (May)
Residential (mil. kwh.)	1,680	1,806	1,634 (May)
Raw steel production:			
Michigan (000 net tons)	942	437	452 (Aug.)
United States (000 net tons)	11,309	6,796	7,019 (Aug.)
Consumer price index (1967 = 100)			
Detroit area	222.2	253.7	255.1 (Aug.)
United States	221.1	247.8	249.4 (Aug.)
U.S. wholesale price index (1967 = 100)	238.3	269.8	273.1 (Aug.)
Michigan farm prices received index (1967 = 100)	225	242	250 (Aug.)

SOURCES: U.S. Bureau of the Census; U.S. Bureau of Labor Statistics; Michigan Crop Reporting Service; Motor Vehicle Manufacturers Association, Inc.; American Iron and Steel Institute; and Edison Electric Institute.

Contracts for Future Building, First 8 Months: 1979 and 1980

(Thousands of Dollars)

Area	Nonresidential			Residential			Total[a]		
	1979	1980	Percentage change	1979	1980	Percentage change	1979	1980	Percentage change
Ann Arbor	56,097	74,352	+ 33	56,122	36,943	−34	112,219	111,295	—
Battle Creek	27,792	15,167	− 45	36,105	9,342	−74	63,897	24,509	−62
Bay City	6,506	15,264	+135	10,855	14,533	+34	17,361	29,797	+72
Detroit	681,730	616,393	− 10	824,379	364,891	−56	1,506,109	981,284	−35
Flint	46,991	57,161	+ 22	63,612	24,133	−62	110,603	81,294	−26
Grand Rapids	154,523	138,257	− 11	130,037	100,261	−23	284,560	238,518	−16
Jackson	14,985	36,709	+145	14,081	7,183	−49	29,066	43,892	+51
Kalamazoo-Portage	29,163	26,929	− 8	49,056	43,152	−12	78,219	70,081	−10
Lansing–East Lansing	59,788	90,013	+ 51	117,748	57,953	−51	177,536	147,966	−17
Muskegon–Norton Shores–Muskegon Heights	14,671	8,903	− 39	20,124	20,277	--	34,795	29,180	−16
Saginaw	24,572	26,665	+ 9	38,276	21,268	−44	62,848	47,933	−24
Michigan	1,289,308	1,193,483	− 7	1,757,477	935,744	−47	3,046,785	2,129,227	−30
United States	33,731,600	33,681,300	—	52,647,100	38,588,300	−27	86,378,700	72,269,600	−16

SOURCE: F. W. Dodge Division of McGraw-Hill Information Systems Company, news releases.

NOTE: Battle Creek includes Barry and Calhoun counties; Detroit includes Lapeer, Livingston, Macomb, Oakland, St. Clair, and Wayne counties; Flint includes Genesee and Shiawassee counties; Grand Rapids includes Kent and Ottawa counties; Kalamazoo-Portage includes Kalamazoo and Van Buren counties; Lansing–East Lansing includes Clinton, Eaton, Ingham, and Ionia counties; and Muskegon–Norton Shores–Muskegon Heights includes Muskegon and Oceana counties.

a. Excludes nonbuilding construction contracts. This category comprises streets and highways, bridges, dams, reservoirs, river and harbor developments, sewerage and water supply systems, missile and space flight facilities, airports, utilities, and communication systems. For Michigan the 1979 and 1980 figures for nonbuilding construction contracts were $684,893,000 and $439,626,000 respectively, or a decrease of 36 percent. U. S. figures for nonbuilding construction contracts were $32,572,600,000 and $22,348,400, or a decrease of 31 percent.

OCCUPATIONAL OUTLOOK

(Continued from page 3)

centers in the state indicate that MSU is typical regarding the demand for various specialties.

EXPORTING HUMAN CAPITAL

Michigan, like other northern industrial states, has a long tradition of attracting people, particularly southerners, who aspire to blue-collar skills and the high pay of jobs in automotive plants, machine shops, and so forth. Their incomes enable them to pay for college educations for their children, many of whom must seek employment elsewhere because of the industrial structure.

This state also has a relatively high proportion of out-of-state students attracted by high quality, inexpensive education, even after paying out-of-state tuition. This phenomenon is more pronounced at the graduate than the undergraduate level.

For these reasons, Michigan is a net exporter of college trained people; that is, more college graduates leave than migrate to the state. Although Michigan data on this matter are not available, the Bureau of the Census does conduct surveys that show the migration pattern, by level of educational attainment, among regions. The 1967 study of male college graduates revealed that 31.1 percent were living in the North Central states when entering college, but only 26.3 percent were residents of that region at the time of the study. According to that survey, "the men who received their bachelor's degree in the Northeast and South were more likely to migrate to another region for their advanced degree than were men who received their bachelor's degrees in the North Central or West. The men with both bachelor's and higher degrees were more likely to have received their highest degree in the North Central Region, 34 percent, than in any of the other three regions of the nation."[1]

Recent data are not as definitive. They show that between March 1975 and March 1979 the North Central states lost 489,000 people with four or more years of college through migration to the South, Northeast, and West.[2] Meanwhile, only 288,000 individuals arrived here from other regions. The data do not reveal where these men and women received their degrees; however, the likelihood is that this region still is a substantial net exporter of college graduates. We also imported 501,000 people with high school diplomas but without college degrees, while exporting 823,000 in this category. Among those with less than a high school education, 212,000 were imported and 290,000 exported.

Sketchy data from Michigan's large universities suggest that between 25 and 30 percent of bachelor's and master's degree recipients leave Michigan. For Ph.D.'s the proportion is higher. Small institutions report that nearly all of their graduates (about 95 percent) find jobs here, but that the proportion having to leave Michigan in order to pursue chosen careers is creeping up. This situation reflects the disarray of our economy as well as prospects elsewhere, particularly in Texas and California.

LONG-TERM OUTLOOK

Between now and 1985, durable goods manufacturing in Michigan is expected to recover and grow, although slowly. Tourism and the convention business will provide a major impetus to employment in the lodgings and restaurant industries especially. Banking, retail trade, legal services, and amusements also are slated for rapid growth. Northern Michigan can expect sizable gains in forest-based industries. Both agriculture and government, in contrast, will provide fewer jobs than they do now.

According to the latest projections by the Michigan Employment Security Commission, growth in the professional and technical occupations will be below average, a dramatic turnaround from previous trends.

> A major factor underlying this change is the reduced growth rate projected for government sector growth, particularly in education. Elementary and secondary school teachers comprise over 21 percent of professional and technical workers, and college and university teachers account for another three percent. While replacement needs will create numerous job openings, the elementary and secondary school teacher employment level is expected to decline, and the number of college and university teachers is not expected to grow. Since these two occupations represent such a large proportion of employment, their pessimistic outlook strongly influences the total professional and technical growth projection.[3]

Except for mining, engineers are not expected to enjoy above average growth in Michigan job opportunities. The ranks of physicians, chiropractors, veterinarians, therapists, and registered nurses will increase rapidly. Other high percentage growth white-collar occupations are entertainer, computer systems analyst, psychologist, sociologist, urban and regional planner, architect, archivist and curator, lawyer and judge, social worker, and personnel and labor and industrial relations worker.

According to the MESC report, the outlook for operatives and craft workers is slightly below average and that for managerial workers slightly above. Clerical and service occupations should be the most rapidly growing group.

The recently released *Michigan's Comprehensive Five-Year Full Employment Plan* included these remarks:

> Growth in the clerical group (the largest of all occupational categories) will be greatly affected by changes in technology: developments in communication devices, computers and word processors. Only those clerical workers such as secretaries and receptionists, whose jobs involve a high degree of personal contact will not be significantly affected.
>
> Although blue collar employment will lag behind growth in white collar occupations there are several notable exceptions. Jobs in the highly skilled construction trades will experience better than average blue collar employment growth due to expected expansion of housing and commercial construction during the 1982–1985 period. Greater technical sophistication in the stock of durable goods will increase the need for mechanics, with the most rapid gains expected for workers who can repair air conditioning and heating equipment, data processing machines, and office machines. Nontransport assemblers and inspector jobs (which account for more employment than any other blue collar group) also will do quite well, primarily due to the introduction

TABLE 1
Supply-Demand Situation of Various Occupations in Michigan: First Quarter 1980

Shortage occupations[a]

Anesthesiologist	Grinder, s/u operator, internal	Nurse anesthetist	Research associate
Assistant professor	Gynecologist	Nurse supervisor	Rug repairer
Biologist	Hydraulic engineer	Orthotics assistant	Sales engineer
Boring jig machine s/u oper.	Industrial engineer	Pediatrician	Sales manager, forging
Chemist	Inspector, sports	Pharmacologist	Soil engineer
Civil engineer	Jeweler	Physician, general practice	Specialty cook, foreign food
Clinical psychologist	Licensed practical nurse	Physicist	Statistician
Diesel mechanic	Machinist	Production engineer	Statistician, applied
Director, res. & development	Maintenance mechanic	Programmer analyst	Stripper, black/white color
Export manager	Mechanical design engineer	Programmer, information system	Systems analyst, EDP
Exporter	Medical lab. technician	Project engineer	Translator
Faculty member	Metallurgist, extractive	Psychiatrist	
Fixture builder	Model maker	Registered nurse	

Occupations with favorable supply-demand relationship[b]

Appointment clerk	Cleaner II	Material handler*	Telephone solicitor*
Architect/engr./surveyor	Companion*	Mechanical engineer tech.	Tennis court attendant*
Bagger	Counter attend., cafeteria*	Occupations in math.	Typist
Billing & rate clerk	Drafter, mechanical	Sales agent, insurance*	Vending & door to door*
Bookkeeper II	Electrical engineer	Sales promotion	Unlicensed practical nurse*
Car hop*	Forest conservation	Stenographer	
Car wash attend., automobile*	Gardening & groundskeeping*	Structural engineer	
Caretaker*	Houseworker, general*	Survey workers	

Surplus occupations[c]

Aircraft mechanic & repairer	Electroplating	Marine mechanic & repairer	Resistance welder
Arc welder & cutter	Excavating, grading, paving	Meatcutter, exc. slaughter	Roofer
Assembler, automobile	Fabricating machine oper.	Medical asst.	Sales, home furn.
Assembler, internal comb. eng.	File, grind, buff, etc.	Melting	Salesperson, automobiles
Assembler, small parts	Finance, ins. & real estate mgmt.	Misc., construction	Sawing
Barber		Misc., metal fab.	Sewing machine oper. mgmt.
Bartender	Finishing & coating	Mixing & blending	Sheet & bar rolling
Boilermaker	Forging	Nurses' aide	Sheet metal worker
Boring	Forming	Ore refine & fndry, NEC	Shipping & receiving clerk
Brazing, braze-weld, soldering	Fruit & nut farming	Paint, decorating and rel.	Stone, clay, glass proc.
Bricklayer	Gear machine	Painter, brush	Structural sheet worker
Cabinetmaker	General farming	Painter, spray	Stuffed furn. & mat., fab. & rep.
Carpenter	Hand sew, mend, embroider, etc.	Pharmacist	Teacher, elementary
Cashier	Heat treating	Pipefitter	Teacher, secondary school
Cement mason	Industrial-truck operator	Plasterer	Tire, tube, & rel., fab. & rep.
Concrete-mixing-truck driver	Laborer, general metal proc.	Plumber	Trailer-truck driver
Construction management	Landscape gardener	Police	Transp., comm., util. mgmt.
Cosmetologist	Lathe oper., production	Power-press tender	Transp. equip. painter
Dump-truck driver	Lawyer	Production clerk	Truck driver, heavy & light
Elect. appl. & fixture assem. & repair	Manager, food service	Production machine tender	Vegetable farming
	Manager, office	Punching & shearing	Welders, combination
Electric wire & cable fab.	Manager, sales	Purchasing agent	Wholesale & retail mgmt.
Electricians mechanic	Manufacturing management	Radio operator	Writer

SOURCE: Michigan Employment Security Commission, *Quarterly Job Openings Report, 1st Quarter, 1980* (Detroit: 1980), pp. 13–15.

a. This group contains occupations in which the demand exceeded supply and actual shortages were known to exist. However, in some instances the number of jobseekers for a specific occupation may exceed the number of openings, and yet that occupation is still considered to be a shortage occupation. The job applicants may lack one or more of the employer requirements, such as education and experience. The following list of shortage occupations was based mainly on alien labor certifications and clearance job orders in addition to the applicants/job openings relationship for the first quarter of 1980.

b. This group of occupations was derived mainly from the job applicants and job orders listed with the MESC employment service offices only. As mentioned earlier, not all applicants or all job openings existing in the job market are listed with the employment service branch offices. Professional workers and unionized skilled labor depend to a large degree on services provided by their associations, unions, and private employment agencies.

In determining the occupations with favorable demand, the number of job openings, openings unfilled thirty days or more, and the ratio of applicants to job openings were used. Some occupations were unwanted by applicants although they enjoyed a favorable demand due to low wages, high turnover, limited or nonexisting fringe benefits, income based on commission, traveling, relocating requirements, and so forth. This type of occupation is marked with an asterisk (*).

c. The list of surplus occupations was extracted from the job applicants registered with MESC branch offices only. As noted before, not all jobseekers register with the MESC job services offices.

In determining the surplus occupations, the ratio of applicants to job openings, the absolute number of applicants, and the seasonality of the job market were taken into consideration.

of new durable goods product lines and greater industry emphasis on quality control.

The influence of Detroit's concentration in manufacturing is clearly evident as the area is expected to have at least 50 percent of the state's annual average job openings for mechanical engineers, tool and die makers, drafting aids and technicians, punch stamping press operators, fork lift operators, and assemblers. Jobs in the professional and technical groups are expected to grow much more rapidly in Detroit than in the state as a whole.

TABLE 2
Fastest Growing Jobs and Jobs with Most Openings in the United States: 1978–1990

Fastest growing[a]		Jobs with most openings[b]	
Occupation	*Number annually*	*Occupation*	*Number annually*
Bank clerks	45,000	Secretaries and stenographers	305,000
Bank officers and financial managers	28,000	Retail sales workers	226,000
Business machine repairers	4,200	Building custodians	180,000
City managers	350	Cashiers	119,000
Computer service technicians	5,400	Bookkeeping workers	96,000
Construction inspectors	2,200	Nursing aides, orderlies and attendants	94,000
Dental assistants	11,000	Cooks and chefs	86,000
Dental hygienists	6,000	Kindergarten and elementary teachers	86,000
Dining room attendants and dishwashers	37,000	Registered nurses	85,000
Flight attendants	4,800	Assemblers	77,000
		Waiters and waitresses	70,000
Guards	70,000	Guards	70,000
Health service administrators	18,000	Blue-collar worker supervisors	69,000
Homemaker–home health aides	36,000	Local truck drivers	64,000
Industrial machinery repairers	58,000	Accountants	61,000
Landscape architects	1,100	Licensed practical nurses	60,000
		Typists	59,000
Licensed practical nurses	60,000	Carpenters	58,000
Lithographers	2,300	Industrial machinery repairers	58,000
Nursing aides, orderlies, and attendants	94,000	Real estate agents and brokers	50,000
Occupational therapists	2,500	Construction laborers	49,000
		Engineers	46,500
Occupational therapy assistants	1,100	Bank clerks	45,000
Physical therapists	2,700	Private household workers	45,000
Podiatrists	600		
Respiratory therapy workers	5,000	Receptionists	41,000
Speech pathologists and audiologists	3,900	Wholesale trade sales workers	40,000
Teacher aides	26,000		
Travel agents	1,900		

SOURCE: Bureau of Labor Stattistics, *Occupational Outlook Quarterly* 24 (Spring 1980), 4.
a. Occupations with growth projections of 50 percent or more.
b. Replacement needs and growth are projected to cause these occupations to offer the largest number of openings.

Other exceptional growth opportunities are expected in occupations in the non-manufacturing and service industries. The overall thrust of non-manufacturing and service growth is expected to produce approximately twice as many annual average job openings in white collar occupations than comparable openings in blue collar occupations.[4]

Everything considered, until the mid-1980s, Michigan youth can anticipate relatively plentiful opportunities after high school or after having earned an associate degree or received technical training at a community college. For those getting four-year and advanced degrees, demand here will match supply for some but not all specialties. Michigan can expect to continue to export some of its most expensive human capital, perhaps as much as 20 percent of new college graduates.

After 1985, the outlook for all youth in this state might be less promising. According to the latest *Michigan Statistical Abstract*, total job growth in Michigan is projected at 5 percent between 1985 and 1990, that is, about one percent annually.[5] This is a baseline forecast; it more or less presupposes business as usual. It is unlikely to materialize because the state probably will devise a development strategy to create new kinds of industries and jobs. For example, a government-industry authority to manage and conduct research on hazardous industrial waste might have the potential for creating 10,000 to 15,000 jobs, at various skill levels. What now seems a monumental problem could become a golden opportunity; to create centers for the storage of chemical, radioactive, and other dangerous by-products of our hospitals, factories, and universities while our industrial and university scientists learn to deal with them more effectively. Michigan, or any other state, could become the center for solid waste management and detoxification for the whole industrial heartland. There are other possibilities for creating jobs to solve problems as well as to meet the demand for new products. In short, there will be industries and occupations in this state in 1990 that cannot be foreseen now. But it seems unlikely that they will be plentiful enough to stem the tide of people, particularly college graduates, leaving for greener pastures.

Table 2 has been excerpted from a recent Bureau of Labor Statistics job projection for 1990 for the United States as a whole. Clearly, in the United States, as in Michigan, the fastest growing categories are service, clerical, and sales workers and not those occupations for which a college degree is required.

NOTES

1. Bureau of the Census, *Current Population Reports* (Washington, D. C.: irregularly), Series P-20, No. 201 (May 1970), pp. 4, 5.
2. Bureau of the Census, *Current Population Reports* (Washington, D. C.: irregularly), Series P-20, No. 353 (August 1980), p. 41.
3. Michigan Employment Security Commission, *Occupational Outlook 1985* (Detroit: January 1980), p. 3.
4. Michigan Department of Labor, Bureau of Employment and Training, *Michigan's Comprehensive Five-Year Full Employment Plan (1981–1985)* (Lansing: July 1980), pp. 30, 31.
5. Division of Research, Graduate School of Business Administration, Michigan State University, *Michigan Statistical Abstract*, 15th ed. (East Lansing: September 1980), p. 969.

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The automotive chapter includes a listing of Michigan companies that pioneered in the industry. A bit of history is also preserved in chapter III, in a description of the founding of Harper Hospital in Detroit, and in chapter IX, which includes material on the building of the state capitol.

Other useful features are the latest statistics on income, employment, population, education, births, deaths, manufacturing, farming, mining, construction, trade, services, and a host of other subjects.

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MICHIGAN'S NO-FAULT AUTOMOBILE INSURANCE

by THOMAS L. WENCK, *Professor of Insurance, Graduate School of Business Administration, Michigan State University*

Automobile insurance is one of the principal types of personal insurance most people purchase to protect themselves from major risks. These risks may be summarized as follows: first, being sued and found legally responsible for the bodily injury and property damage caused to other people and their property; second, being injured or killed in an automobile accident; and third, losses due to one's automobile being damaged or destroyed in a collision or by some other peril such as theft, fire, flood, or windstorm.

The Michigan legislature enacted a no-fault automobile insurance law that took effect October 1, 1973. This law has had a tremendous effect not only on the automobile insurance industry, but also on the legal profession and those required to purchase this insurance. To understand Michigan's no-fault law it is necessary to know something about traditional automobile insurance policies, since these are still in use and are only modified by the provisions of the no-fault law.

The traditional automobile insurance policy consisted of four sections. Section I covered bodily injury and property damage liability. It protected the insured against being sued for damages caused to other people and their property. The insurer paid the damages the policyholder was legally responsible for causing, up to the limit of insurance coverage purchased. The key words are *legally responsible* or *legally liable*. Liability depends upon the degree of negligence in an accident and the type of negligence doctrine adopted in the state in which the accident occurs.

The two types of negligence doctrines are known as contributory negligence and comparative negligence. The former is harsher, since one is not legally liable if it can be shown that the other party in the accident was in any way guilty of negligence that contributed to or caused the accident. Under this doctrine, even if the other party had been as much as 99 percent negligent, a person could not recover damages for injuries from the other party. The one percent negligence would defeat the claim. Under contributory negligence, the claimant can recover damages from the other party only if the claimant was not negligent at all; conversely, the insurer will pay on the policyholder's behalf only if the insured is 100 percent negligent.

Under a comparative negligence doctrine, there would be some recovery, depending upon the type of law in effect. The law may provide that the least negligent person may recover the nonnegligent percentage of his or her damages, while the most negligent party to the accident recovers nothing. Thus, a party who was one percent negligent and sustained $1,000 of bodily injury damages could recover $990 from the person who was 99 percent negligent, or 99 percent of $1,000. The most negligent person's automobile liability insurance would pay the $990 on behalf of its insured, who was legally responsible for the damages. Michigan currently follows the comparative negligence doctrine. Despite the existence of the no-fault law, we shall see shortly the importance of the liability coverages of the automobile insurance contract.

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The second section of the traditional automobile insurance policy provided medical expense insurance. This coverage paid the medical expenses sustained in an automobile accident when the policyholder could not recover from the other party because of contributory or primary negligence. One's own medical expenses would be paid by one's own insurance company under this coverage. Payment was not based on legal liability, but was a moral type of coverage up to the limit purchased. As will be seen shortly, this coverage is completely eliminated by Michigan's no-fault law.

A third section of the traditional policy provides "uninsured motorists" coverage. If a policyholder sustains bodily injury (not property damage) from an accident with an uninsured motorist, and if the policyholder is legally entitled to recover damages (was not guilty of contributory negligence or was least negligent), then the insured will collect for medical and bodily injury expenses from his or her own insurance company under this coverage. Since Michigan's no-fault law makes this coverage virtually worthless, we shall argue that the legislature should outlaw its issuance.

The fourth section of the traditional auto insurance contract provides "physical damage" insurance or coverage for loss or damage to the insured's automobile. The two principal coverages are comprehensive and collision. The former is extremely broad and covers all risks of loss to the automobile except collision losses. The latter covers collision losses and usually is issued with a deductible, such as $50 or $100. In a collision with another automobile, if the insured could not recover from the other driver for the property damage to his or her car because of contributory or primary negligence, the insured party's own collision insurance would pay for the property damage loss over the amount of the deductible carried. Michigan's no-fault law significantly affects collision coverage.

The Michigan law applies to the owners or registrants of all motor vehicles required to be registered in Michigan and of all those driven in Michigan for more than 30 days in any calendar year. Persons who do not have the required insurance are guilty of a misdemeanor; if convicted, a person "shall have his or her license and, if an owner or registrant, his or her registration revoked, and may be fined not less than $100.00 nor more than $500.00, imprisoned for not more than one year, or both."

PERSONAL INJURY PROTECTION

There are three compulsory or required coverages under the no-fault law. The first is called personal injury protection (PIP). PIP benefits protect against financial loss resulting from bodily injuries received in an automobile accident. Family members living with the policyholder, guest passengers in the automobile, and any pedestrians injured by the insured are entitled to benefits under the insured's policy if they do not have a no-fault policy of their own. Since the insured collects PIP benefits from his or her own insurance company, one does not have to sue to receive them; they are paid regardless of who was at fault in the accident. PIP benefits apply both in Michigan and out of state.

The PIP section of the no-fault law includes the following benefits, all of which are health insurance. First, medical, hospital, and rehabilitation expenses are covered on an unlimited basis. Second, should the accident result in the death of an insured party, there is a $1,000 per person funeral expense benefit. Third, there is a dependent survivors benefit payable to the spouse or dependent children of a person who dies as the result of an automobile accident. The amount of this benefit is 85 percent of the decedent's lost wages, up to $1,000 per month for a maximum of 36 months. Survivors do not receive more than the amount for which they were financially dependent on the deceased. The fourth PIP benefit is a work loss benefit.

This last benefit consists of two parts: lost income and substitute services. The lost income benefit is payable if a person is unable to work because of an injury received in an automobile accident. The amount received is 85 percent of lost gross monthly income for up to a maximum of 36 months. There is a monthly dollar maximum, adjusted by the Michigan insurance commissioner and effective every 1 October; it is based on the annual change in the national Consumer Price Index. When no-fault automobile insurance started on 1 October 1973, the maximum monthly lost income benefit was $1,000. Table 1 indicates increases approved by the insurance commissioner since the program's inception. The current monthly maximum is $1,870, which means that if a person's gross monthly income equals or exceeds $2,200, he or she could receive $1,870 for 36 months (if disabled that long) and collect $67,320 from the insurer.

TABLE 1

Michigan's Maximum Monthly Lost Income Work Loss Benefit

Period	*Monthly Max. (in dollars)*	*36 Month Max. (in dollars)*	*Annual Incr. (in percentage)*	*Cum. Incr.* (in percentage)*
10/1/73–9/30/74	1,000	36,000	—	—
10/1/74–9/30/75	1,111	39,996	11.1	11.1
10/1/75–9/30/76	1,213	43,668	9.2	21.3
10/1/76–9/30/77	1,285	46,260	5.9	28.5
10/1/77–9/30/78	1,373	49,428	6.8	37.3
10/1/78–9/30/79	1,475	53,100	7.4	47.5
10/1/79–9/30/80	1,636	58,896	10.9	63.6
10/1/80–9/30/81	1,870	67,320	14.3	87.0

*Base period is 10/1/73–9/30/74.

The second part of the PIP work loss benefit, substitute services, compensates for services ordinarily performed by the injured person, but which can no longer be performed because of the injuries received in an automobile accident. The cost of hiring a substitute, such as a babysitter or domestic help, is covered up to $20 per day for a maximum of three years. However, the substitute services benefit is paid in conjunction with the lost income benefit, which means that the two together cannot exceed the maximum monthly income limit, currently $1,870.

The no-fault law provides that PIP benefits are reduced by any Workers' Compensation and Social Security compensation received. For example, if a person is totally disabled in an automobile accident, the disability benefits

received from Social Security would reduce the amount of lost income benefit received from PIP.

As was previously indicated, the no-fault PIP coverage is essentially health insurance benefits. The no-fault law provides the option of people making either their personal health insurance or their PIP medical-hospital and lost income benefits primary coverage. If personal health insurance is taken as primary coverage, it will pay to its limit, and then the automobile insurance will pay the excess expenses up to the limits of the no-fault law. If personal health insurance is the primary coverage, automobile insurance rates are slightly lower than if the PIP benefits are the primary coverage. Regardless of which is primary, the unlimited medical-hospital benefits under the PIP portion of the no-fault law completely eliminate the medical payments section (usually coverage C of Part II) of the traditional automobile insurance policy issued in Michigan.

We can now understand why uninsured motorist coverage is practically worthless under Michigan's no-fault law. First, there should not be any uninsured motorists, so one should not be involved in accidents with them. Even if one were, one would collect from one's own PIP benefits. If bodily injury damages exceed those provided by PIP benefits, one could recover under uninsured motorist coverage if one were the least negligent party in the accident. The probability of collecting uninsured motorist benefits is, thus, exceedingly small, and Michigan's drivers would be better off saving the premium they now pay for this coverage. If the legislature does not outlaw this coverage, it should at least require the insurance industry to give the insuring public the option of not purchasing it.

PROPERTY PROTECTION INSURANCE

The second compulsory coverage under the no-fault law is called property protection insurance (PPI). If accidental damage is done to someone else's property with one's car, PPI pays the amount of the damage up to $1 million. Excluded is damage to another motor vehicle unless it is legally or properly parked. Also, PPI does not cover damage one's car does to one's own property, including the automobile. PPI pays for direct and indirect or consequential property damage accidentally caused with one's automobile. For example, if a person loses control of his or her vehicle and crashes into a retail establishment, causing $8,000 of direct property damage, PPI will pay the $8,000. Direct losses are valued on a replacement cost less depreciation basis. If, as a result of the accident, the business is shut down while repairs are made, causing a business interruption loss of $12,000, this indirect or consequential loss will also be paid by PPI. The no-fault law provides PPI coverage only in the state of Michigan.

RESIDUAL LIABILITY INSURANCE

The third and final compulsory coverage under Michigan's no-fault law is bodily injury and property damage liability insurance. This is called residual liability insurance because it fills in the gaps in PIP and PPI no-fault automobile insurance, at least to the limits of coverage purchased. The minimums required in Michigan are $20,000/$40,000/$10,000. One must carry at least $20,000 of bodily injury protection for each person one may injure in an automobile accident, and at least $40,000 of bodily injury liability insurance for all of the persons injured or killed in the accident. The $10,000 is the minimum amount of property damage liability insurance one must carry under Michigan law. One can purchase excess limits, such as $50,000/$100,000/$25,000 or $100,000/$300,000/$50,000.

Residual liability insurance is necessary because Michigan's no-fault law provides the right to sue. One may recover from the person who is more than 50 percent negligent in an accident if one sustains serious impairment of a bodily function, permanent and serious disfigurement, or death; if one's lost income exceeds the monthly limit, currently $1,870; or if one's disability and lost income extends beyond 36 months. In Michigan, a party who is more than 50 percent negligent may be sued for these reasons; thus, people must have the residual liability insurance to cover what they are found legally liable to pay to the injured party.

Residual liability also offers protection in an accident with an out-of-state driver not covered by a no-fault law. If a person is sued and held legally responsible, regardless of whether the accident happens in or out of Michigan, residual liability insurance covers the bodily injury and property damage caused.

Prior to 1 July 1980, the Michigan no-fault insurance law provided a property damage tort exemption. One could not sue for any property damage to one's automobile, even if the other driver was entirely at fault. This provision has been slightly modified by Act No. 145 of the Public Acts of 1979, also known as the essential insurance law. We shall see what changes this act effected after discussing the physical damage coverage of the automobile insurance policy.

PHYSICAL DAMAGE INSURANCE

The three mandatory no-fault coverages described above leave a serious gap in protection because they do not cover damage to one's automobile. If the car is older and of limited value, one might elect not to purchase physical damage insurance. If, however, the automobile is not yet paid for or is relatively new and of substantial value, one must (in the case of financing) or may want to purchase the insurance. As noted earlier, the two basic physical damage coverages for a car are collision, which covers collision losses, and comprehensive coverage, which protects the auto from other perils. Together, they constitute essentially "all-risk" coverage for an automobile.

The no-fault law requires one's insurance company to offer collision coverage if one wants to purchase it. There are three kinds available. The first, limited collision, pays for collision damage to the automobile without a deductible amount when the driver is not substantially at fault. If one were substantially at fault and had limited collision coverage, nothing would be recovered. The second kind, regular or standard collision, is issued with a deductible, for example $100 or $200, which the policyholder must pay before the insurance company pays for the loss to the auto above that amount. Regardless of who was at fault

(Continued on page 7)

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Michigan Economic Indicators

Item	Year previous of latest month	Previous month	Latest month
Manufacturing workers:			
Average weekly hours, Michigan	40.6	39.6	40.1 (Sept.)
Average weekly hours, U.S.	40.3	39.3	39.8 (Sept.)
Average hourly earnings, Michigan ($)	8.74	9.38	9.64 (Sept.)
Average hourly earnings, U.S. ($)	6.80	7.30	7.42 (Sept.)
U.S. motor vehicle production (units)	819,068	664,371	852,664 (Nov.)
Michigan electricity usage (mil. kwh.)	6,306	5,719	6,105 (Aug.)
Industrial (mil. kwh.)	2,905	2,414	2,520 (Aug.)
Residential (mil. kwh.)	1,907	1,858	2,030 (Aug.)
Raw steel production:			
Michigan (000 net tons)	823	546	737 (Oct.)
United States (000 net tons)	10,810	7,767	9,442 (Oct.)
Consumer price index (1967 = 100)			
Detroit area	227.2	259.5	264.3 (Oct.)
United States	225.4	251.7	253.9 (Oct.)
U.S. wholesale price index (1967 = 100)	245.6	274.1	277.0 (Oct.)
Michigan farm prices received index (1967 = 100)	229	259	263 (Oct.)

SOURCES: U.S. Bureau of the Census; U.S. Bureau of Labor Statistics; Michigan Crop Reporting Service; Motor Vehicle Manufacturers Association, Inc.; American Iron and Steel Institute; and Edison Electric Institute.

Contracts for Future Building, First 9 Months: 1979 and 1980

(Thousands of Dollars)

Area	Nonresidential			Residential			Total[a]		
	1979	1980	Percentage change	1979	1980	Percentage change	1979	1980	Percentage change
Ann Arbor	62,458	81,808	+ 31	61,491	43,762	− 29	123,949	125,570	+ 1
Battle Creek	29,564	15,995	− 46	37,869	10,622	− 72	67,433	26,617	− 61
Bay City	7,823	15,817	+102	12,929	15,516	+ 20	20,752	31,333	+ 51
Detroit	789,635	666,158	− 16	905,735	423,333	− 53	1,695,370	1,089,491	− 36
Flint	64,754	62,238	− 4	75,358	28,111	− 63	140,112	90,349	− 36
Grand Rapids	227,509	150,717	− 34	143,153	111,763	− 22	370,662	262,480	− 29
Jackson	15,860	37,741	+138	15,730	8,457	− 46	31,590	46,198	+ 46
Kalamazoo–Portage	32,154	30,406	− 5	54,442	48,070	− 12	86,596	78,476	− 9
Lansing–East Lansing	63,622	94,843	+ 49	130,595	70,173	− 46	194,217	165,016	− 15
Muskegon–Norton Shores–Muskegon Heights	17,065	13,867	− 19	22,550	22,259	− 1	39,615	36,126	− 9
Saginaw	30,004	29,994	—	46,225	25,913	− 44	76,229	55,907	− 27
Michigan	1,521,814	1,322,262	− 13	1,955,761	1,091,247	− 44	3,477,575	2,413,509	− 31
United States	38,203,200	38,102,100	—	58,837,200	44,469,300	− 24	97,040,400	82,571,400	− 15

SOURCE: F. W. Dodge Division of McGraw-Hill Information Systems Company, news releases.

NOTE: Battle Creek includes Barry and Calhoun counties; Detroit includes Lapeer, Livingston, Macomb, Oakland, St. Clair, and Wayne counties; Flint includes Genesee and Shiawassee counties; Grand Rapids includes Kent and Ottawa counties; Kalamazoo-Portage includes Kalamazoo and Van Buren counties; Lansing–East Lansing includes Clinton, Eaton, Ingham, and Ionia counties; and Muskegon–Norton Shores–Muskegon Heights includes Muskegon and Oceana counties.

a. Excludes nonbuilding construction contracts. This category comprises streets and highways, bridges, dams, reservoirs, river and harbor developments, sewerage and water supply systems, missile and space flight facilities, airports, utilities, and communication systems. For Michigan the 1979 and 1980 figures for nonbuilding construction contracts were $722,186,000 and $490,250,000 respectively, or a decrease of 32 percent. U. S. figures for non-building construction contracts were $35,079,800,000 and $24,889,400,000 or a decrease of 29 percent.

Quarterly Motor Vehicle Employment and Assembly

Item	1978				1979				1980		
	1	2	3	4	1	2	3	4	1	2	3
EMPLOYMENT[a]											
Checker											
Michigan	1,117	1,118	1,084	1,140	1,207	1,194	1,182	1,099	982	803	735
Chrysler											
Michigan	78,744	82,799	75,187	81,664	75,316	70,238	58,182	55,456	47,273	43,235	
United States	131,066	136,158	125,989	135,997	125,899	118,532	99,754	98,228	86,341	78,908	
Ford[b]											
Michigan	124,187	127,148	126,300	135,377	132,298	129,526	117,630	111,790	104,321	92,458	86,528
United States	234,635	239,517	233,314	253,536	245,253	240,054	211,763	196,038	181,595	160,226	144,068
General Motors											
Michigan	264,000	278,000	267,000	289,000	295,000	296,000	291,000	288,000	267,000	237,000	220,000
United States	588,000	619,000	594,000	643,000	644,000	650,000	582,000	602,000	561,000	499,000	469,000
ASSEMBLY											
Dearborn	40,230	70,007	39,072	83,017	96,572	92,774	85,970	68,819	65,971	70,823	49,852
Detroit	130,969	140,723	54,857[c]	89,563[c]	130,475[c]	113,866[c]	56,399[c]	78,055[c]	57,044[c]	40,016[c]	29,800[c]
Detroit (truck)	7,587	11,443	11,142	30,753[c]	33,693[c]	28,503[c]	12,861[c]	16,534[c]	14,812[c]	5,865	1,687
Flint	93,380	104,042	76,157	109,192	115,405	110,135	56,914	90,222	69,179	65,568	54,201
Flint (truck)	107,414	116,436	103,549	104,839	114,846	95,075	60,985	75,541	70,123	19,975	12,605
Hamtramck	56,098	86,545	56,808	54,230	44,901	62,806	15,345	30,134	1,031[c]	c	c
Kalamazoo	1,361	1,036	809	1,019	1,134	1,268	1,203	1,161	770	810	762
Lansing	93,080	110,381	62,327	116,726	130,644	130,363	72,684	96,143	104,913	82,558	56,769
Pontiac	75,104	87,334	61,666	82,652	91,712	85,977	46,578	61,082	50,974	30,102	26,077
Pontiac (bus & truck)	55,041	67,569	61,741	72,398	77,144	73,922	51,628	42,135	33,850	24,376	21,831
Warren (bus & truck)	76,322	94,415	72,181	84,504	76,365	48,873	5,027	19,043	14,783	28,537	17,107
Wayne	76,242	76,599	63,214	55,607	50,477	46,765	34,081	28,800	27,840	37,401	24,239
Wayne (truck)	53,462	56,436	48,390	52,388	56,052	51,994	21,305	34,256	25,355	7,751	11,890
Wixom	42,915	47,639	36,508	46,902	51,132	36,527	20,013	32,604	8,724	6,896	15,393
Ypsilanti	60,220	73,733	57,178	38,891	38,797	75,420	73,508	70,507	84,598	83,147	66,919
Total Michigan											
Passenger car	669,599	798,039	508,596	654,346	751,250	755,901	462,695	557,527	471,044	417,321	324,012
Bus and truck	299,826	341,141	297,003	368,325	358,100	298,367	151,806	187,509	158,923	86,504	65,120
Total United States											
Passenger car	2,267,474	2,656,507	1,850,701	2,398,411	2,411,307	2,482,907	1,655,546	1,884,756	1,783,732	1,632,826	1,259,897
Bus and truck	865,427	1,019,266	851,996	982,232	1,024,655	916,996	529,092	564,118	499,525	350,607	307,817
Total Canada											
Passenger car	289,695	345,842	229,593	297,157	307,823	281,806	171,427	227,966	225,969	228,428	162,183
Bus and truck	171,127	185,031	120,199	180,355	200,162	190,698	107,988	135,532	146,015	136,314	95,798

SOURCE: Ward's *Automotive Reports;* Motor Vehicle Manufacturers Association of the United States, Inc., P-I report; and companies.

a. Average monthly wage and salary employment of companies with assembly plants in Michigan; includes nonautomotive.

b. Excludes Ford Aerospace and Communications Corporation and finance and insurance subsidiaries.

c. Chrysler's Jefferson Avenue plant was converted to truck production in September 1978. It was returned to car production in August 1980 after having been closed since March 1980. Chrysler's Hamtramck plant closed January 4, 1980.

Quarterly Personal Income in Michigan

Item	Millions of dollars, annual rates, seasonally adjusted							Percentage change 1980(1) to 1980(2)	
	1978	1979				1980			
	4	1	2	3	4	1	2	Michigan	United States
TOTAL LABOR AND PROPRIETORS INCOME BY PLACE OF WORK									
By type									
Wage and salary disbursements	55,150	58,185	57,769	57,363	56,982	57,903	55,963	− 3.4	+ .5
Other labor income	7,147	7,692	7,726	7,691	7,644	7,840	7,596	− 3.1	+ 3.2
Proprietors income	3,903	4,066	4,235	4,347	4,456	4,274	3,991	− 6.6	− 8.1
Farm	560	685	857	829	863	704	613	−12.9	−20.0
Non-farm	3,344	3,382	3,378	3,518	3,593	3,570	3,378	− 5.4	− 5.0
By industry									
Farm	732	868	1,048	1,023	1,058	907	819	− 9.7	−14.3
Non-farm	65,468	69,075	68,683	68,377	68,024	69,109	66,731	− 3.4	+ .4
Private	56,849	60,248	59,640	59,139	58,638	59,555	56,989	− 4.3	+ .1
Ag. serv., for., fish., and other	145	150	155	159	161	158	164	+ 3.8	+ 3.7
Mining	338	350	358	356	367	380	391	+ 2.9	+ 3.1
Construction	3,229	3,392	3,327	3,403	3,384	3,224	3,077	− 4.6	− 4.0
Manufacturing	28,907	31,083	30,126	28,884	27,921	28,352	25,784	− 9.1	− 1.2
Non-durable goods	4,324	4,431	4,447	4,385	4,477	4,475	4,315	− 3.6	+ 1.2
Durable goods	24,583	26,652	25,679	24,498	23,443	23,877	21,468	−10.1	− 2.4
Transportation and public utilities	3,536	3,796	3,802	3,840	3,930	3,939	3,896	− 1.1	+ .9
Wholesale trade	3,308	3,493	3,589	3,670	3,690	3,767	3,762	− .1	+ .8
Retail trade	5,803	5,999	6,058	6,104	6,216	6,346	6,297	− .8	− .9
Finance, insurance, and real estate	2,518	2,623	2,630	2,757	2,740	2,818	2,887	+ 2.4	+ 2.7
Services	9,065	9,362	9,597	9,966	10,231	10,570	10,731	+ 1.5	+ 2.2
Government and government enterprises	8,619	8,827	9,042	9,238	9,386	9,555	9,743	+ 2.0	+ 1.7
Federal, civilian	1,063	1,086	1,075	1,068	1,088	1,099	1,117	+ 1.6	+ 2.5
Federal, military	202	199	196	195	203	197	200	+ 1.5	+ .2
State and local	7,354	7,542	7,771	7,975	8,094	8,259	8,426	+ 2.0	+ 1.7
DERIVATION OF PERSONAL INCOME BY PLACE OF RESIDENCE									
Total labor and proprietors income by place of work	66,200	69,943	69,730	69,401	69,082	70,016	67,550	− 3.5	—
Less: Personal contributions for social insurance by place of work	3,112	3,551	3,530	3,501	3,467	3,603	3,441	− 4.5	− .3
Net labor and proprietors income by place of work	63,087	66,392	66,200	65,900	65,616	66,413	64,109	− 3.5	—
Plus: Residence adjustment	426	435	443	451	460	471	472	+ .2	+ 2.0
Net labor and proprietors income by place of residence	63,513	66,827	66,643	66,351	66,076	66,884	64,581	− 3.4	—
Plus: Dividends, interest, and rent	9,230	9,549	9,816	10,081	10,537	11,050	11,545	+ 4.5	+ 4.6
Plus: Transfer payments	9,117	9,335	9,626	10,523	10,927	11,467	12,330	+ 7.5	+ 2.7
State U.I. benefits	369	405	469	741	959	1,208	1,964	+62.6	+36.9
Transfers excl. state U.I.	8,748	8,930	9,157	9,782	9,967	10,259	10,366	+ 1.0	+ 1.3
Personal income by place of residence	81,860	85,711	86,085	86,955	87,540	89,402	88,456	− 1.1	+ 1.1

SOURCE: Bureau of Economic Analysis, Regional Economics Information System.

MICHIGAN'S NO-FAULT AUTOMOBILE INSURANCE

(Continued from page 3)

in the accident, the deductible must be paid before recovering from the insurance company. The third type, broadended collision, is like regular collision except that, if the other party in the accident is substantially at fault (more than 50 percent), one does not have to pay the deductible but can collect the entire loss from one's insurance company.

Most people objected to the property damage tort exemption in the law once they understood they could not sue the person at fault and that they would have to collect from their own insurance. As indicated above, the Michigan legislature partially corrected that situation in Act No. 145 by providing for suit to recover property damage to a vehicle for up to $400, to the extent that the damages are not covered by insurance. The law also provides that a person's residual liability property damage insurance may not pay this $400. Suit should be brought in the small claims division of the district court, the conciliation division of the common pleas court of the City of Detroit, or the municipal court. One can only recover in court if less than 50 percent negligent.

The effect of this partial removal of the property damage tort exemption is to permit recovery of damages up to $400 if one does not have collision insurance. With limited collision insurance, people cannot sue because recovery is made from their insurance company if they are less than 50 percent at fault. Likewise, under broadened collision, they cannot sue because they have no deductible and collect the entire loss from their insurer if they are less than 50 percent at fault. If they are more than 50 percent at fault, the law provides that damages may not be assessed in their favor in court, so they cannot recover from the other party in the accident. If they carry regular collision, they can sue and recover their loss to the extent of the deductible up to $400. Again, recovery assumes that they were less than 50 percent at fault in the accident. If property damage to the car is $1,000, if one is not at all negligent, and if one carries regular collision with a $200 deductible, suit can be brought to recover the $200 deductible from the other driver, and $800 is then collected from one's insurance company.

Since the law provides that residual property damage liability insurance and other no-fault provisions do not cover the $400 maximum for which one may be found liable, the driver is uninsured unless he or she "buys back" the excluded property damage liability coverage. Most companies are offering this provision for $8.00 per year per car. If a person purchased it and is sued and found liable, his or her buy-back insurance will pay for the property damage of up to $400 that he or she is legally liable for in a collision.

SOME OBSERVATIONS

Automobile insurance is provided in a rather complex package policy that is not readily understood by most people. This descriptive article has attempted to explain automobile insurance and Michigan's no-fault law. Although the Michigan law is the most liberal in the nation, it certainly is not perfect. In the author's judgment, calling it no-fault is misleading because the element of fault is very much a part of PIP benefits, residual liability, and collision recoveries. Also, while it appears that most people are reasonably satisfied with PIP and residual liability insurance, there seems to be considerable dissatisfaction over the property damage tort exemption that forces recoveries back to one's own collision coverage. It is premature to judge the optional buy back up to $400 of excluded property damage liability coverage, but on its face this partial relief from the tort exemption appears a very superficial and inadequate solution. Finally, given the extremely low probability of recovering anything from uninsured motorist coverage, it is recommended that its issuance be prohibited in Michigan.

Summary of Michigan's No-Fault Automobile Insurance

Effective: 1 October 1973.
Applies to: Owners or registrants of

a. All motor vehicles required to be registered in Michigan, and
b. All motor vehicles driven in Michigan for more than 30 days in any calendar year.

No-Fault Coverage

I. PIP—personal injury protection (applies in and out of state).
   A. Medical and hospital expenses—unlimited (primary or excess).
   B. Funeral expenses—$1,000 per person.
   C. Work loss
      1. Lost income—85 percent up to $1,870/mo.—maximum of 36 months ($67,320).
      2. Substitute services—up to $20/day (combined work loss cannot exceed $1,870/mo.).
   D. Dependent survivors—85 percent up to $1,000/mo.—maximum of 36 months ($36,000).

II. PPI—property protection insurance—$1,000,000 (applies only in state).

III. Residual liability insurance—minimum coverage:
   A. Bodily injury—$20,000 each person, $40,000 each occurrence.
   B. Property damage—$10,000 each occurrence.

Optional Physical Damage Coverage

I. Collision coverage options:
   A. No coverage.
   B. Limited collision.
   C. Regular collision.
   D. Broadened collision.

II. Comprehensive coverage—optional.

Optional Buy-Back Coverage

I. Buy back up to $400 of excluded property damage liability coverage.

MICHIGAN FAMILY SOURCEBOOK

Edited by

Mary P. Andrews, Ph.D. and Robert P. Boger, Ph.D.

The *Michigan Family Sourcebook* is a reference book of statistical information about Michigan families and their interactions with systems in society. All of the information included in the sourcebook is Michigan data collected from the most current census reports, agency records, published surveys, and special releases. When available, county level data are also presented.

The family is the focus of this collection of descriptive information. The sourcebook contains a variety of types of data organized to describe Michigan families and the forces that affect them. Conditions and trends are highlighted to help the reader explore possible implications.

This 280 page, soft cover sourcebook was designed as a resource for agencies, organizations, and individuals working with families. The tables and figures provide ready access to information needed when documenting the needs of families, establishing program directions, or developing funding proposals. The sourcebook is organized to help locate specific information or to assist professionals and lay persons to better understand general trends affecting families. Tables and graphs are in a full-size, camera-ready format, convenient for making transparencies to use in presentations or to insert in other documents.

The *Michigan Family Sourcebook* is a product of the Institute for Family and Child Study at Michigan State University and was developed by faculty from the College of Human Ecology and the Family Living Education Program of Michigan's Cooperative Extension Service.

To order, please send your name and address plus $8.00 remittance per copy to:

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East Lansing, Michigan 48824

BRIEF

Factory sales of U.S. made **automobiles** to Canada rose by 7 percent, to 582,097 during 1979, up from the 1978 level of 541,552. These figures were released recently by the Motor Vehicle Manufacturers Association of the U.S., Inc., which also reported that U.S. exports to other countries rose by 22 percent, from 130,075 to 158,991. Plants in Canada sent 582,386 cars to the United States, a substantial 24 percent drop from the 1978 level of 764,835. Car exports from Canada to countries other than the United States also declined, from 107,037 to 92,726.

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ECONOMY AT YEAR-END

by DAVID I. VERWAY, *Research Professor, Division of Research, Graduate School of Business Administration, Michigan State University*

Among Michigan's 63 labor markets, only Ontonagon County experienced no employment decline in any of its broad economic sectors between October 1979 and October 1980. Nine other labor markets in Michigan showed overall employment gains during the October-October period, but declines in some categories. The recently formed Upper Peninsula Shipbuilding Company is largely responsible for the gain in Ontonagon.

In Delta County, second in percentage gain in nonfarm wage and salary jobs, Mead Paper Company is expanding its plant in Escanaba, creating jobs for approximately 700 construction workers.

Three other Upper Peninsula labor markets were among the gainers: Houghton-Keweenaw, Chippewa, and Alger counties. The new Copper Country Mall and increases in durable goods manufacturing and state government employment have provided the stimulus in the Houghton-Keweenaw area. Chippewa County hosts one of the nation's finest industrial parks, on the site of Kincheloe Air Force Base, closed down in 1977. Base housing was sold to a private developer, who can offer the homes at very attractive prices. Alger County has experienced improved tourism this year in comparison with the very depressed level of 1979, when the gasoline scare discouraged travel to the U.P. generally.

Employment in Marquette and Menominee counties declined at a sharper rate than statewide between October 1979 and October 1980. Both the Empire and Republic mines, operated by Cleveland Cliffs, have been closed due to low demand for iron ore. Also, several hundred construction jobs are absent from this year's data, since Cleveland Cliffs has completed its new facilities. Menominee is economically depressed by the slump in durable goods manufacturing.

All told, the U.P. experienced about the same rate of job decline as the state as a whole.

Among the dozen areas most heavily affected by this year's slump, ten are located in the northern Lower Peninsula. Except for Lake and Presque Isle counties, the primary factor was curtailed durable goods production and the spinoff effects on those small economies. Presque Isle hosts two mines that ship limestone to steel mills and cement kilns. In the tiny Lake County economy, tourism was a disappointment.

Two of the dozen areas most affected by this year's economic conditions are in southern Michigan. Branch and Hillsdale counties were victims of slumping durable goods production. The same phenomenon is responsible for the situation in Jackson, the most severely depressed of Michigan's Standard Metropolitan Statistical areas. The complete list is shown in Table 1.

Michigan lost more than 140,000 nonfarm wage and salary jobs between October 1979 and October 1980, a decline of almost 4 percent. Between the previous peak level in this statistical series (February 1979) and the deepest point of the recession (August 1980), the number of such jobs declined by 300,000. Since August, 60,000 of those jobs have been recovered owing largely to production of 1981 model passenger and commercial vehicles.

By every measure, Michigan has been more seriously affected by this recession than has any other state. Largely unscathed are Wyoming,

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TABLE 1
Percentage Change in Nonfarm Wage and Salary Jobs in Michigan Labor Markets: October 1978–October 1980

Areas	Oct. 1979 to Oct. 1980	Oct. 1978 to Oct. 1979	Areas	Oct. 1979 to Oct. 1980	Oct. 1978 to Oct. 1979
Charlevoix	−15.4	+ 1.1	Muskegon, Oceana	− 3.3	+ 1.1
Montmorency	−15.0	−23.1	Isabella	− 3.1	+ 3.5
Lake	−14.6	+ 5.1	Schoolcraft	− 3.0	0
Missaukee, Wexford	−13.5	+ 7.5	Barry, Calhoun	− 2.6	− 1.9
Crawford	−11.0	− 1.0	Otsego	− 2.6	− .9
Manistee	−10.5	+ 2.9	Roscommon	− 2.6	+ 5.5
Antrim	− 9.8	+ 4.5	Washtenaw	− 2.5	+ .9
Presque Isle	− 9.5	− 4.5	Kalamazoo, Van Buren	− 2.3	+ 2.0
Branch	− 9.4	− 7.2	Dickinson	− 2.2	+ 1.0
Hillsdale	− 9.0	− 5.9	Gogebic	− 2.1	+11.4
Ogemaw	− 8.6	− 3.2	Iron	− 2.1	− 2.1
Emmet	− 8.4	− 2.2	Mason	− 2.1	− .3
Jackson	− 7.6	− .5	Allegan	− 1.9	+ 1.9
Cass	− 7.5	− 6.6	Clinton, Eaton, Ingham, Ionia	− 1.3	+ 1.3
Huron	− 7.4	+ 1.9	Kent, Ottawa	− 1.2	+ 1.5
Marquette	− 7.1	− 3.8	Mackinac	− .8[1]	− 2.4
Arenac	− 7.0	−10.9	Alpena	− .5	− 7.0
Alcona, Iosco	− 6.7	− 2.2	Gladwin, Midland	− .4	+ 1.9
Genesee, Shiawassee	− 5.8	− .3	Grand Traverse, Kalkaska, Leelanau	− .3	+ 1.9
Berrien	− 5.7	− 1.2	Baraga	0	− 2.8
Lenawee	− 5.2	+ 2.7	Luce	0	+ 2.3
Oscoda	− 5.1	− 2.5	Gratiot	+ .2	− 4.0
Saginaw	− 4.8	− 2.7	Chippewa	+ .3	− 6.6
Benzie	− 4.3	+ 2.6	Newaygo	+ .8	− 1.2
Menominee	− 4.3	+ 6.3	Mecosta	+ 1.0	− 3.5
Tuscola	− 4.3	+ 3.5	Alger	+ 1.1	0
Clare	− 4.1	− 6.2	Osceola	+ 1.1	+ 3.4
Lapeer, Livingston, Macomb,			Houghton, Keweenaw	+ 4.1	− 1.9
Oakland, St. Clair, Wayne	− 3.9	− 2.8	St. Joseph	+ 4.2	− 2.9
Bay	− 3.7	− 1.4	Delta	+ 6.0	− .9
Montcalm	− 3.5	+ 3.7	Ontonagon	+ 7.0	+ 8.4
Cheboygan	− 3.4	+ 5.4			
Sanilac	− 3.4	− 6.4	Michigan	− 3.9	− 1.3

SOURCE: Developed from Michigan Employment Security Commission, special release.
1. For the year as a whole, Mackinac County will show a substantial gain due to especially high level employment during the summer.

Louisiana, Texas, and Oklahoma, all petroleum and natural gas exporters, and Florida, Nevada, and Massachusetts. Florida attracts retirees and others who enjoy its climate. Nevada's casinos attract big spending tourists and conventioneers. Massachusetts has fashioned a high technology economy out of what was, until a few years ago, an economy almost as volatile as Michigan's.

November nonfarm job figures are not available at this writing (18 December), but November data on civilian employment, which includes farm employment as well as domestic and other self-employed, were released 5 December. They showed a slippage from October, on a seasonally adjusted basis, and the October figure was itself below September's, evidence that the recovery in Michigan has aborted. High interest rates and scarcity of money for installment loans have depleted the ranks of vehicle customers, forcing production cuts and layoffs in the automotive industry. Quite likely, layoffs will increase in December and again in January. Chrysler Corporation already has furloughed its production workers until mid-January; its suppliers will react accordingly. It is conceivable that by February 1981 the slump in this state will exceed the depths plumbed in August 1980.

Short-term interest rates have skyrocketed, and money is scarce. This is largely attributable to the Federal Reserve Board's tightening of the money supply as well as to high loan demand to finance unsold merchandise. Inventories are high in retailers' warehouses, on new car lots, in petroleum bulk storage, in gasoline and diesel fuel tanks, in manufacturers' warehouses, and nearly everywhere else in the economy.

OUTLOOK: 1981

The new year opens against the backdrop of an OPEC design to raise oil prices. Even so, notwithstanding the supply question posed by protracted hostilities between Iran and Iraq, a sharp runup in the price of gasoline is unlikely because, in the face of bloated worldwide stocks of petroleum and its derivatives, demand is declining. Holding inventories is expensive at today's interest rates.

Even if the new administration deregulates oil immediately rather than in September, as now scheduled, gasoline prices in this country are not likely to increase more than a few cents a gallon, say, 8 percent. Middle distillates will increase more rapidly because of a cold winter; these include home heating oil, jet fuel for airplanes, and diesel fuel for cars, trucks, and buses, among other end uses.

On 1 January 1981 the rate of Social Security contributions rises from 6.13 percent each for employer and employee on the first $25,900 of each worker's earnings this year to 6.65 percent each on the first $29,700. A general cut in tax rates on personal and corporate income, coming possibly as early as April, will neutralize the Social Security hike and then some. Likely, the tax cut will be retroactive, creating, in effect, lump-sum rebates in the first paychecks affected.

The nation already is in the early stages of an inventory liquidation, evidenced by pre-Christmas sales, Chrysler rebates, and Ford sales incentives. Excepting food, interest rates, and energy, the dominant pressures on prices already point toward moderation in the rate of inflation. Even in food, there is some evidence that the upward forces on prices are going to be less intense than many, including this author, were predicting two months ago.

Barring a shock, such as another major war in the Middle East, the stage is set for a sharp decline in short-term interest rates in early 1981 and for some relief from price inflation. If this does occur, all of the fundamentals are in place for a shift in demand toward the larger and mid-size passenger cars and the vans and recreational vehicles that Michigan is well positioned to supply. The physical need for them is intensifying because of the drop in vehicle purchases since March 1979 by households that require larger vehicles and would like to replace their aging fleet of inefficient cars purchased during the early 1970s.

According to the scenario suggested by considerations such as these, Michigan faces another winter of rising unemployment and welfare rolls, fiscal crises in state and city governments, and loss of human capital as people seek work elsewhere. Even though Chrysler likely will survive with help from Washington, more of its plants will close, at least temporarily. Some supplier plants will close also.

The rate of unemployment will climb to over 14 percent (not seasonally adjusted) in February 1981 and end the year above 10 percent. Civilian employment, which reached its high point of 4,045,000 in July 1979, is expected to dip to 3,725,000 in February 1981. That represents a contraction of 320,000, peak to trough, or 8 percent. Those figures are seasonally adjusted. By December 1981, 220,000 of that deficit will have been eliminated as the recovery gains momentum.

Typically, the average length of workweek in factories lengthens more rapidly than the increase in number of jobs during the early stages of recovery. For many tasks that need to be performed, it is easier, less risky, and cheaper to extend hours of those already in the plant than it is to recall those on layoff or to hire new workers. For 1980, the workweek will average around 40 hours in Michigan factories. It can be anticipated that the 1981 figure will be about 42 hours. Average weekly earnings of production workers in 1981 will climb to approximately $440, compared with this year's $375, estimated. The 1979 figure was $360. The 17 percent gain forecast for 1981 may seem modest in light of the hike in overtime, premium pay, and today's wage escalation, but special dampening factors next year include a wage freeze at Chrysler and the possibility of one at Ford.

During the calendar year, about 2.8 million motor vehicles will be assembled in Michigan, compared with 2.2 million estimated for 1980. For the United States as a whole, car, truck, and bus production will total 9.3 million, compared with 8.2 million estimated for 1980.

Michigan tourism should benefit from the rapidly rising costs of air travel and the inconvenience of service from medium sized metropolitan areas in Michigan, Ohio, and Indiana. These factors are making northern Michigan more competitive with the South and West in travel cost as well as accessibility. Detroit does a brisk convention business. On a lesser scale, several outstate Michigan cities are becoming known in the business travel and convention business. This is especially true of Grand Rapids, Traverse City, and Kalamazoo. Battle Creek is joining this market, and there is every reason to believe that Lansing will, too.

AROUND THE STATE

Developments already under way put Delta, Crawford, and Ontonagon counties in the top growth echelon. In Delta, the Mead expansion is gaining a momentum that will produce a construction peak next summer and have a large effect on the area through purchases from local suppliers and increased payrolls of construction workers. Crawford is slated for construction by Weyerhauser, which will be building a wafer board plant suited to mixed hardwood forests and a resin plant to supply the binding agent. In Ontonagon County, UPSCO will be employing additional workers as it reaches full capacity to produce barges, and a refining plant is to be built at White Pine to remove silver from copper.

Mackinac Island is expected to enjoy a very good summer tourist season, a big plus for Mackinac and Cheboygan counties. Several other vacation areas in the northern Lower Peninsula also can expect business to be much improved over 1980, offsetting sluggishness in manufacturing and mining activities.

In southern Michigan, St. Joseph County is growing rapidly because of the new General Motors Hydramatic plants in Three Rivers and Constantine. Flint should be the growth leader among Standard Metropolitan Statistical Areas. General Motors intends to build a new assembly plant in that area, creating construction jobs. Meanwhile, Buick assembly in the old plant should increase next spring to match the anticipated sales pace. The Chevrolet small truck plant also will have to add workers to satisfy demand, after the winter lull.

Several counties should experience employment increases in 1981 but still remain depressed. Charlevoix is perhaps the best example. Its 4 percent job gain, predicated on tourism stimulating an otherwise torpid economy, will not make up for the sharp downturn of 1980.

The above analysis of areas within the state was based on questionnaires returned from chambers of commerce and other local experts along with conversations with economists and planners in the various areas. Where local contacts could not be established, the 1974–1975 pattern of change, modified to suit current conditions, was used. Table 2 has a ranking of labor markets according to job expectations during the coming year.

Questionnaires also were sent to all of the state's banks

(Continued on page 6)

The MICHIGAN STATE ECONOMIC RECORD

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Michigan Economic Indicators

Item	Year previous of latest month	Previous month	Latest month
Manufacturing workers:			
Average weekly hours, Michigan	40.6	39.6	40.1 (Sep.)
Average weekly hours, U.S.	40.3	39.3	39.8 (Sep.)
Average hourly earnings, Michigan ($)	8.74	9.38	9.64 (Sep.)
Average hourly earnings, U.S. ($)	6.80	7.30	7.42 (Sep.)
U.S. motor vehicle production (units)	819,068	852,664	708,964 (Nov.)
Michigan electricity usage (mil. kwh.)	5,998	6,105	5,900 (Sep.)
Industrial (mil. kwh.)	2,881	2,520	2,598 (Sep.)
Residential (mil. kwh.)	1,751	2,030	1,874 (Sep.)
Raw steel production:			
Michigan (000 net tons)	823	546	737 (Oct.)
United States (000 net tons)	10,810	7,767	9,442 (Oct.)
Consumer price index (1967 = 100)			
Detroit area	231.3	264.3	266.4 (Nov.)
United States	227.5	253.9	256.2 (Nov.)
U.S. wholesale price index (1967 = 100)	247.2	277.0	278.4
Michigan farm prices received index (1967 = 100)	229	259	263 (Oct.)

SOURCES: U.S. Bureau of the Census; U.S. Bureau of Labor Statistics; Michigan Crop Reporting Service; Motor Vehicle Manufacturers Association, Inc.; American Iron and Steel Institute; and Edison Electric Institute.

Contracts for Future Building, First 10 Months: 1979 and 1980

(Thousands of Dollars)

Area	Nonresidential			Residential			Total[a]		
	1979	1980	Percentage change	1979	1980	Percentage change	1979	1980	Percentage change
Ann Arbor	68,232	92,135	+ 35	68,431	53,238	− 22	136,663	145,373	+ 6
Battle Creek	30,444	23,212	− 24	39,796	16,624	− 58	70,240	39,836	− 43
Bay City	10,610	16,416	+ 55	15,816	17,120	+ 8	26,426	33,536	+ 27
Detroit	875,239	804,440	− 8	998,467	513,223	− 49	1,873,706	1,317,663	− 30
Flint	71,712	69,370	− 3	81,107	33,956	− 58	152,819	103,326	− 32
Grand Rapids	248,349	151,142	− 39	155,291	123,309	− 21	403,640	274,451	− 32
Jackson	16,334	38,334	+135	17,797	9,504	− 47	34,131	47,838	+ 40
Kalamazoo–Portage	39,423	33,723	− 14	62,540	55,398	− 11	101,963	89,121	− 13
Lansing–East Lansing	82,766	100,669	+ 22	140,477	84,102	− 40	223,243	184,771	− 17
Muskegon–Norton Shores–Muskegon Heights	19,771	14,681	− 26	24,351	24,663	+ 1	44,122	39,344	− 11
Saginaw	35,313	33,074	− 6	49,482	28,230	− 43	84,795	61,304	− 28
Michigan	1,711,123	1,515,930	− 11	2,153,064	1,292,814	− 40	4,707,693	3,407,925	− 28
United States	42,958,900	42,907,600	− —	65,665,700	51,620,700	− 21	146,210,100	121,428,100	− 17

SOURCE: F. W. Dodge Division of McGraw-Hill Information Systems Company, news releases.

NOTE: Battle Creek includes Barry and Calhoun counties; Detroit includes Lapeer, Livingston, Macomb, Oakland, St. Clair, and Wayne counties; Flint includes Genesee and Shiawassee counties; Grand Rapids includes Kent and Ottawa counties; Kalamazoo-Portage includes Kalamazoo and Van Buren counties; Lansing–East Lansing includes Clinton, Eaton, Ingham, and Ionia counties; and Muskegon–Norton Shores–Muskegon Heights includes Muskegon and Oceana counties.

a. Excludes nonbuilding construction contracts. This category comprises streets and highways, bridges, dams, reservoirs, river and harbor development, sewerage and water supply systems, missile and space flight facilities, airports, utilities, and communication systems. For Michigan the 1979 and 1980 figures for nonbuilding construction contracts were $843,506,000 and $599,181,000 respectively, or a decrease of 29 percent. U. S. figures for nonbuilding construction contracts were $37,585,500,000 and $26,899,800,000 or a decrease of 28 percent.

Year-to-Year Change in Selected Economic Indicators

Indicator	Percentage change from previous year												
	1979			1980									
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.
Civilian employment													
United States	+ 2.1	+ 2.0	+ 2.2	+ 1.8	+ 1.6	+ 1.1	+ .9	+ .5	− .1	− .3	− .1	− .3	− .2
Michigan	+ 1.4	+ 1.4	− .9	− 2.1	− 3.1	− 4.3	− 4.4	− 7.3	− 6.5	− 7.3	− 4.1	− 5.1	− 5.2
Detroit area[a]	− .4	− .5	− 2.1	− 3.7	− 4.6	− 5.6	− 6.0	− 8.8	− 7.9	− 8.2	− 4.8	− 5.9	
Outstate[b]	+ 3.0	+ 3.1	+ .3	− .6	− 1.8	− 3.0	− 2.9	− 5.9	− 5.2	− 6.5	− 3.5	− 4.4	
Wage and salary jobs[c]													
United States	+ 3.0	+ 2.6	+ 2.4	+ 2.4	+ 2.3	+ 1.9	+ 1.7	+ .9	+ .1	− .2	−	+ .1	+ .2
Michigan	− 1.3	− 2.2	− 2.3	− 2.9	− 3.5	− 3.8	− 4.9	− 7.0	− 6.9	− 7.2	− 4.8	− 4.8	− 3.9
Detroit area[a]	− 2.9	− 3.8	− 3.2	− 3.8	− 4.6	− 4.9	− 6.3	− 8.1	− 7.6	− 7.7	− 4.8	− 4.8	− 3.9
Outstate[b]	+ .2	− .7	− 1.4	− 2.0	− 2.3	− 2.7	− 3.5	− 6.0	− 6.2	− 6.7	− 4.8	− 4.8	− 3.9
Average workweek[d]													
United States	− 1.0	− 1.5	− 1.2	− .7	− 1.0	− 2.0	+ 1.3	− 2.0	− 2.5	− 2.8	− 1.8	− 1.2	− 1.2
Michigan	− 7.6	−10.1	− 8.5	− 5.9	− 7.0	− 6.5	+ 6.4	− 6.4	− 5.5	− 3.6	− 2.2	− 1.2	+ .2
Average weekly earnings[e]													
United States	+ 6.7	+ 5.9	+ 6.3	+ 6.3	+ 6.1	+ 5.5	+ 9.6	+ 5.4	+ 5.3	+ 5.5	+ 7.0	+ 7.8	+ 8.3
Michigan	− 1.1	− 6.3	− 3.4	− .6	− 1.5	+ .3	+14.6	− 2.2	+ 1.5	+ 3.4	+ 6.6	+ 8.9	+12.5
Motor vehicle assembly													
United States	−20.1	−31.8	−33.5	−38.2	−33.9	−36.6	−28.5	−50.2	−43.7	−48.2	−32.4	−17.6	−16.7
Michigan	−46.8	−29.8	−41.0	−40.7	−38.7	−49.7	−40.6	−62.1	−50.9	−54.4	−35.8	−20.1	−16.2
General Motors	−19.4	−17.8	−27.6	−24.0	−23.7	−45.0	−36.0	−60.9	−49.3	−44.9	−36.9	−22.7	− 9.2
Ford	−18.2	−28.3	−51.4	−52.7	−49.1	−47.2	−46.7	−54.1	−34.7	−69.0	−31.3	−15.7	−18.0
Chrysler	−62.4	−64.8	−69.1	−77.5	−80.5	−74.0	−54.9	−77.1	−73.7	−86.2	−48.5	−16.5	+34.5
Steel tonnage poured													
United States	−10.7	−14.2	−15.4	− 3.6	− 2.2	− 9.0	−12.6	−27.9	−38.7	−42.5	−37.9	−26.3	−12.7
Michigan	−20.5	−18.2	−18.9	−16.3	− 7.8	−20.7	−18.7	−42.9	−62.7	−54.8	−52.0	−33.4	−10.4
Commercial electricity consumption													
United States	+ 1.0	+ 2.2	+ .8	− 2.1	− .7	+ 1.7	+ 1.4	− .8	+ 1.1	+ 6.4	+ 7.9	+ 8.3	
Michigan	+ 1.0	+ 3.5	+ 2.3	− 2.7	+ .7	+ .2	+ 3.9	− 2.8	− 4.4	+ 2.0	+ 4.6	+ 5.2	
Industrial electricity consumption													
United States	+ .3	+ .1	− .7	− 1.0	+ 1.1	− 1.0	− 2.8	− 6.4	− 7.2	− 7.7	− 6.4	− 2.0	
Michigan	−10.1	−11.2	−13.2	−16.0	−10.1	−14.7	−10.3	−26.1	−28.2	−19.8	−13.3	− 9.8	
Nonresidential construction contracts													
United States	+14	− 6	+18	+10	+12	+ 3	− 5	− 7	+ 6	+ 6	− 2	− 1	+ 6
Michigan	− 5	+28	− 8	+28	−33	−24	+ 1	+15	+ 8	+31	−38	−41	+10
Residential construction contracts													
United States	− 3	−21	− 9	− 9	− 5	−34	−39	−44	−30	−11	−17	− 2	−
Michigan	−25	−24	−28	−27	−13	−37	−69	−55	−55	−37	−38	−22	+ 5
Nonbuilding construction contracts													
United States	−41	− 7	−19	−20	−60	−36	−50	−33	−24	−41	+76	+ 3	−13
Michigan	+28	−70	−71	−76	−49	+28	−51	−41	−24	−29	− 8	+35	−11
Retail sales													
United States	+11.2	+10.5	+ 8.3	+12.1	+14.6	+ 3.5	+ 4.9	+ 4.3	+ 1.9	+ 9.2	+ 3.4	+ 5.4	+ 8.2
Michigan	+ 5.2	+ 4.7	+ 5.0	+ 8.9	+ 7.3	− 3.6	− 1.8	− 4.1	− 5.9	+ 6.1	− 2.4	+ 1.2	+ 2.8
Detroit area[a]	+ 1.5	+ 4.9	+ 5.1	+ 9.6	+ 7.4	− 2.0	+ .1	− 4.0	− 4.0	+ 8.9	+ 1.5	+ 6.4	+11.2
Detroit city	− 3.5	+ .7	+ 6.4	+20.0	+14.1	+ 4.6	− .7	− 6.8	−10.6	− 4.2	− 9.6	− 3.7	+ .7
Suburbs	+ 2.5	+ 5.8	+ 4.8	+ 7.5	+ 6.0	− 3.4	+ .2	− 3.4	− 2.6	+11.7	+ 3.7	+ 8.1	+13.3
Outstate[b]	+ 9.7	+ 4.5	+ 4.9	+ 8.0	+ 7.2	− 5.5	− 4.0	− 4.3	− 8.3	+ 2.8	− 6.7	− 4.6	− 6.7
Consumer price index													
United States	+12.2	+12.6	+13.3	+13.9	+14.1	+14.7	+14.7	+14.4	+14.3	+13.2	+12.8	+12.7	+12.6
Detroit[a]	+13.1	+14.5	+15.3	+15.7	+15.1	+14.8	+16.4	+16.1	+19.2	+15.6	+14.8	+16.0	+16.3

SOURCE: Michigan Employment Security Commission, special release; Bureau of Labor Statistics, *The Employment Situation* (monthly); Motor Vehicle Manufacturers Association, special release; American Iron and Steel Institute, special release; Energy Information Administration, special release; F. W. Dodge Division of McGraw-Hill Information Systems Company, news releases (monthly); and Bureau of the Census, *Monthly Retail Trade*.

a. Wayne, Oakland, Macomb, Livingston, Lapeer, and St. Clair counties.
b. Michigan minus Detroit area.
c. The number of wage and salary jobs, except agricultural, reported by employers.
d. Average hours worked by manufacturing production workers.
e. Average earnings among manufacturing production workers.

ECONOMY AT YEAR-END

(Continued from page 3)

and savings and loan associations requesting them to express their judgments about their areas and Michigan's future in a very general way. They were asked to compare the general level of economic activity in the third quarter of 1980 with that expected in the last quarter of 1980 and each quarter in 1981. Those results are tabulated in columns 1 - 5 of Table 3. In order to summarize them, this author assigned weights of 0 for the answer "same," −2 for "slightly worse," −4 for "quite a bit worse," −8 for "substantially worse," +2 for "slightly better," +4 for "good increase," and +8 for "substantial increase.' The results of this exercise are shown in the bottom panel of Table 3.

On balance, these financial executives expected a worse fourth as compared to third quarter in 1980 in every region of Michigan. With the exception of the northeast, not much improvement is anticipated during the first quarter of 1981, but then the economy of the state and of each of its regions is forecast to strengthen, entering 1982 on an upswing (see Table 3).

In answer to another set of questions, with the exception of southwest Michigan, these executives expect their areas to have an improved level of economic activity for 1981 as a whole over 1980. They also expect the state as a whole to experience less economic activity during the coming year. That seeming inconsistency can be explained by there being only five returns from Wayne County, an area which, like Berrien County in the southwest, might indeed suffer from declining activity through much of 1981. Nearly all of Chrysler's employment, it must be remembered, is in Wayne County.

Respondents expect good improvement during 1982 statewide and in their own areas, especially the latter. There is continued growth projected into 1983, slight growth in 1984, and none in 1985, if the responses are taken literally. Indeed, the answers seem to indicate a slight downturn for 1985. Because of the vagueness of the question, and the fact that various individuals attached different scales to the choices of economic change listed for them, perhaps only one definite conclusion should be attempted: The bankers and savings and loan executives who responded to the questionnaire (approximately 35 percent of those queried), anticipate a weak Michigan economy during 1981 and strength for 1982 and 1983.

TABLE 2
Michigan Labor Markets Listed According to Ranking in Forecast of Job Change: 1980–1981

Name of area	*Counties included*
4.5 percent or more growth	
Grayling	Crawford
Escanaba	Delta
Ontonagon	Ontonagon
St. Ignace	Mackinac
Three Rivers	St. Joseph
3.0 to 4.4 percent growth	
Traverse City	Grand Traverse, Kalkaska, Leelanau
Sault Ste. Marie	Chippewa
Baldwin	Lake
Newaygo	Newaygo
Roscommon	Roscommon
Alpena	Alpena
Flint	Genesee, Shiawassee
Iron Mountain	Dickinson
Cheboygan	Cheboygan
Reed City	Osceola
1.5 to 2.9 percent growth	
Marquette	Marquette
Clare	Clare
Mt. Pleasant	Isabella
Manistee	Manistee
Big Rapids	Mecosta
Adrian	Lenawee
Houghton, Hancock	Houghton, Keweenaw
Gaylord	Otsego
Charlevoix	Charlevoix
Frankfort	Benzie
Standish	Arenac
Midland	Gladwin, Midland
Alma	Gratiot
Ironwood	Gogebic
Kalamazoo, Portage	Kalamazoo, Van Buren
0 to 1.4 percent growth	
Lansing, East Lansing	Clinton, Eaton, Ingham, Ionia
Petoskey	Emmet
Battle Creek	Barry, Calhoun
East Tawas	Alcona, Iosco
L'Anse	Baraga
Greenville	Montcalm
Mio	Oscoda
Manistique	Schoolcraft
Grand Rapids	Kent, Ottawa
Mancelona	Antrim
Iron River	Iron
Bay City	Bay
Munising	Alger
Dowagiac	Cass
Muskegon, Norton Shores, Muskegon Heights	Muskegon, Oceana
Saginaw	Saginaw
Detroit	Lapeer, Livingston, Macomb Oakland, St. Clair, Wayne
.1 to 1.5 percent decline	
Menominee	Menominee
Rogers City	Presque Isle
Ann Arbor	Washtenaw
Ludington	Mason
Cadillac	Missaukee, Wexford
Allegan	Allegan
Newberry	Luce
West Branch	Ogemaw
Caro	Tuscola
1.6 to 3.0 percent decline	
Jackson	Jackson
Bad Axe	Huron
Sandusky	Sanilac
3.1 percent or more decline	
Atlanta	Montmorency
Coldwater	Branch
Benton Harbor	Berrien
Hillsdale	Hillsdale

NOTE: Growth is based on annual average for 1980 and 1981. Monroe County is part of the Toledo, Ohio, labor market. No forecast has been prepared for this area by this author.

Focusing on 1982 alone, the northern lower peninsula expects to be the strongest section of the state, and, on average, respondents expect Wayne County to be the weakest.

BEYOND 1981

It seems unlikely that the loan guarantee board will reject Chrysler's latest bid. If it does, Chrysler will likely find a suitor, if not Peugeot or Mitsubishi, then possibly one of its major suppliers. If Chrysler is forced into bankruptcy, it will be reorganized. Whatever form the reshuffling takes, the outcome for Michigan jobs will be much the same: even fewer than the present level of approximately 40,000. During 1978, the company had more than 80,000 Michigan employees; by March 1981, the figure will probably be about 35,000. If the automotive scenario sketched above holds, that figure might climb back to 40,000 at year-end.

Ford employs about 35,000 fewer people in Michigan now than during fall 1978. The kind of turnaround envisaged in the automotive forecast would entail recovering at most 15,000 of those jobs by the end of 1981.

General Motors employment in the Wolverine State conceivably could be 20,000 greater in December 1981 than now. Suppliers located here also will increase their work forces.

By fall 1982, Volkswagen will be employing about

TABLE 3
Results of a Survey of Michigan Banks and Savings and Loan Associations, Mailed 25 November 1980, Received by 12 December 1980

	Number anticipating each degree of change in general level of economic activity compared with third quarter 1980					*Number anticipating each degree of change in general level of economic activity compared with full year 1980*				
	1980	*1981*								
Degree of Change	*4th quarter*	*1st quarter*	*2nd quarter*	*3rd quarter*	*4th quarter*	*1981*	*1982*	*1983*	*1984*	*1985*
Own Area										
Substantially worse	14	14	6	3	1	3	1	1	1	1
Quite a bit worse	19	18	7	2	2	3	2	2	2	2
Slightly worse	47	44	28	11	8	23	4	2	5	7
Same	32	35	43	25	12	36	15	13	15	15
Slightly better	16	17	41	78	75	59	76	41	32	31
Good increase	2	2	4	8	29	4	26	59	58	53
Substantial increase	0	0	0	1	0	0	2	6	9	11
Entire State										
Substantially worse	16	11	5	4	2	4	1	1	0	1
Quite a bit worse	24	29	17	5	6	13	5	3	2	3
Slightly worse	53	52	40	16	7	21	9	3	9	9
Same	27	28	40	45	33	52	30	24	20	25
Slightly better	8	8	26	51	62	36	60	55	43	37
Good increase	0	0	0	8	16	1	20	32	38	33
Substantial increase	0	0	0	0	0	0	0	5	8	11
Average of responses, by region										
Entire state										
Own area	−1.9	−1.8	+ .3	+1.1	+1.8	+ .4	+2.0	+2.7	+2.8	+2.8
Entire state	−2.5	−2.3	−1.1	+ .3	+1.1	− .9	+1.2	+2.0	+2.3	+2.2
Upper Peninsula										
Own area	−2.2	−2.3	− .6	+1.3	+1.6	+ .9	+2.0	+2.9	+3.5	+3.2
Entire state	−2.6	−2.0	−1.0	+ .6	+1.4	− .5	+1.0	+2.3	+3.2	+3.1
Northeast Lower Peninsula										
Own area	−2.5	−1.5	+ .5	+2.0	+1.5	+1.2	+3.5	+3.2	+4.0	+3.7
Entire state	−2.8	−2.5	− .5	+1.2	+1.5	− .8	+1.5	+2.8	+2.6	+2.6
Northwest Lower Peninsula										
Own area	−1.2	−1.5	− .3	+1.4	+2.0	+ .8	+2.3	+2.9	+2.6	+2.0
Entire state	−3.1	−3.1	−1.7	− .3	+ .7	−1.1	+ .6	+1.3	+1.7	+1.3
West Central										
Own area	−1.2	−1.4	− .3	+ .7	+1.8	+ .2	+1.5	+2.4	+2.5	+2.7
Entire state	−2.5	−3.1	−1.5	− .2	+ .5	− .9	+ .6	+1.6	+1.6	+1.2
Southwest										
Own area	−3.6	−3.1	− .8	+ .8	+1.9	− .5	+1.9	+3.0	+2.4	+1.4
Entire state	−4.0	−2.9	− .8	+ .3	+1.1	−1.2	+1.3	+1.7	+1.9	+1.4
East Central										
Own area	−1.1	−1.4	+ .2	+1.4	+2.2	+ .7	+2.1	+2.5	+2.6	+3.2
Entire state	−1.7	−2.1	−1.1	+ .7	+1.6	+ .3	+1.9	+2.5	+2.6	+2.9
Southeast										
Own area	−2.1	−1.8	− .5	+ .5	+1.4	+ .4	+1.9	+1.9	+3.0	+2.8
Entire state	−2.4	−1.9	−1.1	0	+ .6	− .5	+ .8	+2.2	+2.6	+2.6

5,000 people to assemble cars in Sterling Heights. General Motors will be building cars in new plants near Pontiac, in Detroit, and in Flint. The amount of net job gain is unknown because many of the assembly workers will be transferred from the old Pontiac, Cadillac, and Buick plants, which will be converted to other use.

Even under relatively optimistic assumptions, there are likely to be approximately 75,000 fewer automotive and supplier jobs in Michigan in 1982 as compared with the 1978 peak.

The competition Michigan faces is formidable. We vie with Ohio and Indiana for the high-skill, high-wage jobs. Th Autopact with Canada, which served Michigan so well until 1978, is now a disadvantage. Canada is demanding and will get from North American vehicle manufacturers not just a bigger share of component production, but also a fairer shake on the higher technology end of it. In addition, much of the research and development that Ontario lost to Michigan during the 1970s will be repatriated during the 1980s. Canada, however, will remain a good market for larger passenger vehicles that bear a Michigan stamp.

At the low skill end of componentry, we compete no longer so much with cheap southern labor as with the cheaper Mexican, Spanish, and Brazilian work forces. Products affected include wiring, mufflers, and tailpipes. Three wire harness and two muffler-tailpipe plants were terminated in Michigan this year. Since not many such plants are left, further attrition will be modest.

Much more so than now, cars of the mid-1980s and beyond will have electronic fuel injection instead of mechanical (carburetors) systems, electronic sensors to warn of malfunction, electronics to fine tune engines during highway use in order to increase miles per gallon, and computers to monitor trips and to advise the driver on miles driven, miles to destination, and so forth.

Small cars use less steel, forgings, cast iron, copper, aluminum, and almost everything else than large ones. Smaller large cars use plastic and aluminum in place of iron and steel wherever possible. These trends are not favorable for Michigan's gray iron foundries, steel mills, and castings plants. Smaller engines will affect the market for Michigan's piston ring and bearing manufacturers, among others.

Because Detroit will not be able to raise capital to finance all of the redesigning and retooling to meet the demands of the 1980s, we will import more components, particularly engines, transmissions, and transaxles for front-wheel-drive cars. Against this, we can expect to export a larger proportion of Wolverine State specialties.

Demand for quality means greater use of robots in assembly. Depending on the relative prices of labor, capital, and energy, and on the degree of specialization in each plant, there could also be greater use of robotics in material handling as well. This better quality also means a larger number of people involved in quality control.

Beyond 1981, Michigan's role in passenger car and component manufacturing depends more than anything else on its ability to meet the quality challenge of the Japanese. This holds true not only for management but also for labor and not just in Detroit but in Cadillac, Benton Harbor, and other places where components are made. Assuming that the challenge is met, a substantial employment job gain, around 6 percent, is forecast for 1982 (Table 4).

Not to be overlooked is this state's considerable stake in truck and bus production. Here, the Japanese penetration has taken place in a market segment that did not previously exist: minitrucks. As a counter, next year GM will begin producing its own version, in Dayton, Ohio, and Pontiac, to replace the Chevy Luv, which it now imports from Japan. In Louisville, Kentucky, Ford will produce a minitruck to replace the Courier, also a Japanese-made vehicle. Volkswagen of America will make its minitruck in Sterling Heights, along with a passenger car.

A U.S. market for medium class diesel trucks was not thought to exist until European manufacturers moved in. Since the invasion by Mercedes Benz, Volvo, Saviem, and IVECO, Ford and General Motors have responded with their American-made products.

The U.S. market for heavy duty trucks still is dominated by American companies because these vehicles, designed for coast-to-coast trucking, are not made overseas. With the deregulation of trucking, however, shorter hauls will become common, providing an opening for European versions of heavy duty road tractors.

TABLE 4
Average Annual Number of Wage and Salary Jobs in Michigan by Broad Industrial Category: Actual 1979, Estimated 1980, and Forecast 1981 and 1982

	(In thousands)			
Category	*1979*	*1980*	*1981*	*1982*
Manufacturing	1,151	983	990	1,045
Contract construction	140	120	120	140
Transportation, communication, and public utilities	159	154	155	160
Wholesale trade	172	167	165	175
Retail trade	585	580	590	660
Finance, insurance, and real estate	153	157	165	180
Services	631	644	665	700
Mining	13	13	13	15
Federal government	56	57	57	60
State government	150	153	145	140
Local government	417	422	410	405

SOURCE: Actual data from Michigan Employment Security Commission, special release; projections from Division of Research, Graduate School of Business Administration, Michigan State University.
NOTE: Figures based on actual data through October 1980; projections thereafter.

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RESEARCH CENTER FOR DETROIT

by CORINNE L. GILB, *Director, Department of Planning, City of Detroit*

On October 21, 1980, Mayor Coleman A. Young announced a grant from the U. S. Department of Commerce for a Cooperative Generic Technology (COGENT) Center in the City of Detroit. Eventually, the grant will total $8 million. Initial U. S. funding will begin as soon as matching funds of $5 million have been raised nationally from industrial firms.

While some think-tanks are exurban, a center-city location can be advantageous for fast moving research involving multiple interfaces. Detroit's plan is to develop a highly visible research park, with a clear identity and suitable amenity, close to resources of all kinds, including efficient transportation.

RESEARCH PROGRAM

Research will be in computer integrated manufacturing, focusing on near-net shape materials forming, that is, the use of computer applications in the manufacturing processes of forging and casting industries, using strip metal, powdered metal, and composites. The value of computer integrated manufacturing (CIM) is becoming increasingly clear for the quality control and efficiency needed to help American manufacturers compete with foreign companies.

The establishment of a CIM center in Detroit will serve several purposes. It can fill an information gap regarding the concept and development of CIM systems. The high cost of this research has prevented private firms from undertaking exhaustive CIM research projects. This center, through its hardware development, testing, and information gathering will offer technical and consulting assistance to interested parties.

Research into CIM small-batch manufacturing can lead to reduced production costs and greater efficiency.

The CIM approach would include Computer Aided Design (CAD) to reduce development time and costs and Computer Aided Manufacturing (CAM) to increase manufacturing efficiency and reliability. Group technology, that is, the grouping of parts by similarity of production, can make possible greater economies of scale in small-batch manufacturing. CIM also can be used for better materials management, scheduling, machine control, and source data collection. It provides techniques for direct interaction by design laboratories, business offices, and manufacturing and assembly lines.

The following research program has been suggested by Harold Bogart, formerly of Ford Motor Company, and Stanley Stynes, Dean of Engineering at Wayne State University:

> Near net-shape forming processes such as super-plastic forming require research into deformation mechanisms, computer modeling of metal flow, and combination of forming and bonding processes. Advanced nondestructive test techniques, such as optical correlation of methods for evaluating surface distortion, could be investigated.

Preliminary Population Counts: 1980, by Ching-li Wang and Laurence S. Rosen / page 3

BEST AVAILABLE COPY

Formability requirements are becoming increasingly stringent. Research is needed in the formability of high-strength steels (with their associated low strain-hardening coefficients), the development of highly formable materials such as dual-phase steels without the need for microalloying additions, the formability of aluminum alloys, and the formability of metal-plastic-metal laminates such as steel-polpopylene/steel and aluminum/nylon/aluminum. Tests for formability of sheet materials need to be developed to evaluate parameters such as strain-hardening and strain-rate-hardening coefficients under complex stress conditions.

Computer-assisted modeling of sheet metal formability requires further development to incorporate design modifications, material substitution, lubricant substitution, friction, and so forth, for all but the simplest shapes.

Effective use of oriented materials such as Kevlar- and graphite-fiber reinforced composites is possible only if the directional properties of the composite are matched to service conditions. Research could be conducted into the rheological behavior of fiber-containing matrices during forming operations such as molding or stamping. Development of high-rate production processes is critical for application of composites in mass production industries.

Fabrication of parts from dissimilar materials (such as in metal-matrix composites) may be accomplished by diffusion bonding. Research could be done on the processes of adhesion as influenced by temperature, pressure, and surface fibers; on modeling of cohesion and bond strength; and on nondestructive testing of bonds.

The materials problems outlined above are only one aspect of the total forming process. For example, in sheet metal forming, other aspects include part design, die design and construction, lubrication, and press adjustments. Computer-aided design techniques should be used to improve the materials selection and design process.

The principles of structure/property relationships and control of properties through thermomechanical processing of metals such as steel and high-strength aluminum alloys are fairly well understood. These principles often lack practical applications, however. The problem is to adapt existing processing, equipment, and techniques to take advantage of possible improvements, which are understood in principle, by sequencing or redesigning heat treatment/mechanical working steps. Research and development is needed in the use of computer-aided methods for this purpose.

It is hoped that as the quality of the center's research commands international respect and yields visible practical results, Detroit and Michigan will gain in reputation as major centers of industrial innovation. Such a reputation is an important asset with valuable economic side effects. To have the state's leading city more visibly modern will be a source of pride.

The advanced industrial world is on the threshold of an era comparable in importance to the early decades of the industrial revolution. The next decade will see great acceleration in the application of electronics to processes of all kinds—in the office, the schoolroom, the laboratory, the library, the home, and the factory. If Michigan rises to the challenges and opportunities of the electronics revolution, it can reinforce and reclaim its traditional position as a leading industrial state. If it does not respond quickly, expertly, or wisely enough, recent losses of population, jobs, and income will continue.

Modernization of industrial processes, of course, means automation. Robots and computers will replace people, but they will also create new jobs. Workers will be needed to make and maintain the new machinery. Until robots make robots, or make the robots that make the robots, blue-collar workers will still be needed; and so will many more computer-maintenance technicians.

Near-net shaping will eliminate the need for some kinds of machine tooling, but it also will create a market for new kinds of machine tools.

New industrial technology can be especially important to mature cities such as Detroit. It makes sense for robot manufacturers to locate in the industrial heartland, where their market is. Detroit and Michigan have always been major centers for the machine tool industry. Improved research capacity in the city and state will be an attraction.

The center will be run by a nonprofit corporation with a majority of its directors from the private sector. A blue-ribbon industrial task force is being formed to define mission and structure, to solicit membership, and to bring the enterprise to the point of formal incorporation and election of a board of directors. The board will hire a manager and staff.

SITE AND ORGANIZATIONAL AFFILIATIONS

During its start-up phase, the center will be located in leased facilities, preferably in a proposed research park, along with some private industrial research and development facilities and headquarters for a university consortium. The permanent facility, which will require about 160,000 square feet, will be developed by the Detroit Economic Growth Corporation, a public-private partnership of business, government, labor, and community members. The building will be owned by the Growth Corporation and leased to the Detroit Cooperative Generic Technology Center. It is proposed to have 40,000 square feet of heavy industrial space, 40,000 square feet of light industrial space, and 80,000 square feet for offices, laboratories, a computer center, classrooms, and other uses.

In addition to the Detroit Economic Growth Corporation, members will include Detroit Renaissance, Inc., the Greater Detroit Chamber of Commerce, the Inner City Business Improvement Forum, Northeast Manufacturers Association, Society of Manufacturing Engineers, Michigan Energy and Resource Research Association, General Motors, Burroughs Corporation, Bendix Corporation, Rockwell International, Ford Motor Company, Gulf and Western, Chrysler Corporation, the United Auto Workers, the University of Michigan, Wayne State University, and the University of Detroit. Several other companies, institutions, and associations have indicated an interest.

Much of the spadework has yet to be done, but the project is moving. While the Technology Center is in process of formation, inquiries can be directed to the City of Detroit's Planning Department, 3400 Cadillac Tower, Detroit, Michigan 48226.

PRELIMINARY POPULATION COUNTS: 1980

by CHING-LI WANG *and* LAURENCE S. ROSEN, *Office of the Budget, Department of Management and Budget*

The preliminary counts of the 1980 census of population and housing recently released by the U. S. Census Bureau show 9,236,891 people in Michigan as of April 1, 1980.[1] This figure represents an increase of 355,065 persons from 8,881,826 a decade ago. Population growth in Michigan has slackened in the past ten years; Michigan has grown by only 4 percent since the last decennial census, and this is less than one-third of the growth rate the state experienced between 1960 and 1970. For the United States as a whole, the total 1980 population is 226 million, an increase of 11 percent between 1970 and 1980. Michigan's population growth during the past decade is significantly lower than the national rate. The state has become the eighth largest in population, dropping from seventh, a rank it had held since the turn of the century.

POPULATION CHANGE BY COUNTIES

Since 1970, population has increased in 90 percent of Michigan's counties. The fastest growing (30 percent or more) include Kalkaska (103.4), Livingston (70), Roscommon (65), Gladwin (47.2), Oscoda (44.8), Crawford (46.2), Otsego (43.8), Montmorency (42.3), Clare (42.8), Missaukee (40.3), Grand Traverse (39.6), Ogemaw (38.1), Lake (37.8), Alcona (36.6), Lapeer (33.7), and Arenac (32.3). With the exception of Livingston and Lapeer, all of the fastest growing counties are located in the northern lower peninsula.

Other fast growing counties (between 20 percent and 30 percent) include Eaton (28 percent), Allegan (22.1), Ottawa (22.5), Oceana (21.6), Newaygo (24.5), Osceola (27.2), Wexford (26.8), Benzie (29.9), Antrim (28.2), Charlevoix (20.3), Emmet (24.3), Cheboygan (24.3), and Isabella (21). These are located either in the northern lower peninsula or in areas adjacent to the central counties of metropolitan areas.

More moderately growing counties are located primarily in the southern lower peninsula, and they tend to cluster in the metropolitan fringe areas surrounding several of Michigan's major urban centers. For example, St. Clair (15.4 percent), Macomb (11.1 percent), Oakland (11.6 percent), Washtenaw (11.7 percent), Lenawee (13.4 percent), Monroe (12 percent), Tuscola (17 percent), and Sanilac (15.8 percent) counties all surround southeastern Michigan's metropolitan centers and all experienced moderate rates of growth. Midland (15.5 percent), Shiawassee (12.8 percent), Clinton (14.9 percent), Ionia (12.7 percent), Montcalm (19.8 percent), and Barry (19.8 percent) counties are adjacent to Bay City, Saginaw, Flint, Lansing, Grand Rapids, and Battle Creek, respectively. Southwestern Michigan counties adjacent to Kalamazoo, such as Van Buren (18.7 percent), Cass (14.3 percent), and St. Joseph (18 percent), also experienced moderate growth during the past ten years.

The counties growing most slowly (less than 10 percent growth rate) are located mainly in southern lower Michigan and in the Upper Peninsula. Those that contain the central cities of Standard Metropolitan Statistical Areas experienced particularly slow rates of growth. These include Bay (2.1 percent), Saginaw (3.7 percent), Genesee (1.1 percent), Ingham (4.3 percent), Jackson (5.6 percent), Kalamazoo (5.1 percent), and Kent (8 percent). Berrien, Branch, and Hillsdale counties, along Michigan's southern border, also joined the list of slow growth areas, along with Huron (6.9 percent), Gratiot (3.0 percent), and Alpena (5.0 percent) counties farther north. In addition, in the remote areas of the Upper Peninsula, only Marquette County experienced substantial growth, while all of the Upper Peninsula's other counties either grew very slowly or declined.

Nine Michigan counties lost population during the past decade—Wayne (−12.9 percent), Muskegon (−0.2 percent), Calhoun (−0.8 percent), Chippewa (−10.6 percent), Gogebic (−5.1 percent), Iron (−1.5 percent), Ontonagon (−6.8 percent), Luce (−1.9 percent), and Keweenaw (−13.3 percent). Wayne County alone has declined by more than 345,000 persons since 1970. Most of the other declining counties are in the Upper Peninsula.

Despite the uneven pace of population growth in the past ten years, the rank order of population size among counties has not changed much. This is especially true among counties with populations over 50,000 (see Table 1). Two exceptions are Livingston, which jumped from the rank of twenty-fourth largest county in 1970 to eighteenth in 1980, and Ottawa, which jumped from fourteenth to twelfth. Wayne is still the largest county in the state (2,324,697), although its population has declined by 12.9 percent since 1970. Oakland is still second with a population of more than one million, followed by Macomb with a population of 694,458. Forty-four percent of Michigan's population remains concentrated in these three counties.

In contrast, some dramatic changes in ranking by size occurred among counties with populations under 20,000. Roscommon jumped from a rank of seventieth to sixty-second, and Kalkaska jumped from seventy-ninth to seventieth. Ontonagon slid from a rank of sixty-seventh to seventy-third, and Luce dropped from seventy-sixth to eighty-second. Keweenaw remained smallest, with only 1,964 people in 1980.

POPULATION CHANGE AMONG MAJOR CITIES

Following the trend throughout most of the United States, major cities in Michigan experienced a general decline in population during the past ten years. The preliminary counts show that more than 75 percent of the major cities in Michigan are losing population. With the exception of Ann Arbor, almost every city with more than 50,000 residents in 1970 had a net population loss between the two decennial censuses. The most dramatic

(Continued on page 5)

[1]As required by Public Law 94-171, final state population totals were presented to the President on January 1, 1981. Final detailed figures for counties, cities, and other substate localities are due to be released no later than April 1, 1981.

The MICHIGAN STATE ECONOMIC RECORD

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Michigan Economic Indicators

Item	Year previous of latest month	Previous month	Latest month
Manufacturing workers:			
Average weekly hours, Michigan	41.0	40.1	41.1 (Oct.)
Average weekly hours, U.S.	40.2	39.8	39.8 (Oct.)
Average hourly earnings, Michigan ($)	8.94	9.64	10.03 (Oct.)
Average hourly earnings, U.S. ($)	6.82	7.43	7.49 (Oct.)
U.S. motor vehicle production (units)	607,205	708,964	612,398 (Dec.)
Michigan electricity usage (mil. kwh.)	5,873	5,900	5,860 (Oct.)
Industrial (mil. kwh.)	2,859	2,598	2,762 (Oct.)
Residential (mil. kwh.)	1,639	1,874	1,726 (Oct.)
Raw steel production:			
Michigan (000 net tons)	753	737	760 (Nov.)
United States (000 net tons)	9,997	9,442	10,057 (Nov.)
Consumer price index (1967 = 100)			
Detroit area	231.3	264.3	266.4 (Nov.)
United States	227.5	253.9	256.2 (Nov.)
U.S. wholesale price index (1967 = 100)	247.2	277.0	278.4 (Nov.)
Michigan farm prices received index (1967 = 100)	232	264	267 (Nov.)

SOURCES: U.S. Bureau of the Census; U.S. Bureau of Labor Statistics; Michigan Crop Reporting Service; Motor Vehicle Manufacturers Association, Inc.; American Iron and Steel Institute; and Energy Information Administration.

Contracts for Future Building, First 11 Months: 1979 and 1980

(Thousands of Dollars)

Area	Nonresidential 1979	Nonresidential 1980	Nonresidential Percentage change	Residential 1979	Residential 1980	Residential Percentage change	Total[a] 1979	Total[a] 1980	Total[a] Percentage change
Ann Arbor	72,318	99,276	+ 37	72,601	56,537	−22	144,919	155,813	+ 8
Battle Creek	32,340	25,885	− 20	41,514	20,350	−51	73,854	46,235	−37
Bay City	11,695	16,623	+ 42	16,385	17,842	+ 9	28,080	34,465	+23
Detroit	956,407	995,996	+ 4	1,056,257	571,031	−46	2,012,664	1,567,027	−22
Flint	80,858	85,026	+ 5	94,558	37,392	−60	175,416	122,418	−30
Grand Rapids	256,656	166,346	− 35	164,167	136,471	−17	420,817	302,817	−28
Jackson	19,983	43,806	+119	26,736	10,519	−61	46,719	54,325	+16
Kalamazoo–Portage	43,057	45,563	+ 6	66,942	58,755	−12	109,999	104,318	− 5
Lansing–East Lansing	95,090	109,041	+ 15	146,782	106,303	−28	241,872	215,344	−11
Muskegon–Norton Shores–Muskegon Heights	20,808	15,494	− 26	25,500	26,395	+ 4	46,308	41,889	−10
Saginaw	36,433	39,024	+ 7	51,089	36,104	−29	87,522	75,128	−14
Michigan	1,858,486	1,800,437	− 3	2,291,049	1,436,706	−37	4,149,535	3,237,143	−22
United States	46,717,200	47,767,100	+ 2	70,356,100	57,654,800	−18	117,073,300	105,421,900	−10

SOURCE: F. W. Dodge Division of McGraw-Hill Information Systems Company, news releases.

NOTE: Battle Creek includes Barry and Calhoun counties; Detroit includes Lapeer, Livingston, Macomb, Oakland, St. Clair, and Wayne counties; Flint includes Genesee and Shiawassee counties; Grand Rapids includes Kent and Ottawa counties; Kalamazoo-Portage includes Kalamazoo and Van Buren counties; Lansing–East Lansing includes Clinton, Eaton, Ingham, and Ionia counties; and Muskegon–Norton Shores–Muskegon Heights includes Muskegon and Oceana counties.

a. Excludes nonbuilding construction contracts. This category comprises streets and highways, bridges, dams, reservoirs, river and harbor developments, sewerage and water supply systems, missile and space flight facilities, airports, utilities, and communication systems. For Michigan the 1979 and 1980 figures for nonbuilding construction contracts were $867,766,000 and $636,189,000 respectively, or a decrease of 37 percent. U. S. figures for nonbuilding construction contracts were $40,926,800,000 and $29,271,300,900 or a decrease of 28 percent.

(Continued from page 3)

change occurred in Detroit, where population decreased by 21.3 percent (−321,841). Other cities with a net loss of more than 15 percent include Flint (−17.5 percent), Saginaw (−15.6 percent), Royal Oak (−17.9 percent), Dearborn Heights (−15.5 percent), Lincoln Park (−15.1 percent), Bay City (−15.9 percent), Wyandotte (−17.3 percent), Allan Park (−16.2 percent), and East Detroit (−15.9 percent). All of these are either older industrial cities associated with automobile manufacturing or older, close-in suburbs of Detroit. In addition, Grand Rapids, Lansing, Kalamazoo, Jackson, Battle Creek, and Muskegon all lost population. The central city of every metropolitan area except Ann Arbor experienced population decline since 1970.

Despite the overall decline in these larger cities, some major cities in Michigan gained substantially in the past ten years. The Detroit suburb of Sterling Heights, for example, has a 1980 population of 108,998, an increase of 47,633 or 77.6 percent from 61,365 in 1970. Troy, a commercial center and residential suburb north of Detroit, increased from 39,419 in 1970 to 67,003 in 1980, growing by 70 percent. Also growing are the Detroit suburbs of Taylor (10.6 percent), Southfield (8.9 percent), and Farmington Hills (18.9) and Portage, a suburb of Kalamazoo. Small increases also occurred in Ann Arbor (3.5 percent), East Lansing (1 percent), and Wyoming (5.4 percent). All of these growing cities are located in major metropolitan areas. None, however, is a major manufacturing center nor is any directly dependent on the auto industry.

POPULATION CHANGE IN METROPOLITAN AREAS

Among the twelve Standard Metropolitan Statistical Areas (SMSA) in Michigan, only that of Detroit, which includes six counties (Wayne, St. Clair, Oakland, Macomb, Livingston, and Lapeer), lost population in the past ten years. All of the others experienced growth ranging from 2 percent in the Muskegon–Norton Shores–Muskegon Heights SMSA to 11.7 percent in the Ann Arbor SMSA and 11.5 percent in the Grand Rapids SMSA. As discussed above, the major SMSA cities have experienced general population decline. Thus, growth in these areas is primarily due to the increase of population in suburban areas of counties in the urban fringe. The degree of population loss to the central metropolitan city determines the overall growth rate of the metropolitan areas. For example, the Ann Arbor SMSA had the highest population growth among SMSAs because the city of Ann Arbor continued growing during the past decade. In contrast, the drastic decline in the City of Detroit and its immediate surrounding areas caused a 2.1 percent decrease for the entire metropolitan area despite fast growth in fringe counties such as Livingston and Lapeer and moderate but substantial growth in Oakland, Macomb, and St. Clair.

Although detailed 1980 census data will not be available for some time, analysis of intercensal estimates indicate that most growth in Michigan's metropolitan areas has been due to natural increase (births exceeding deaths) rather than to migration.[2] Based on preliminary calculations, the Battle Creek, Bay City, Detroit, Jackson, Muskegon, and Saginaw SMSAs all experienced substantial outmigration during the past decade. In contrast, the Ann Arbor, Grand Rapids, Kalamazoo–Portage, and Lansing–East Lansing SMSAs, and the Michigan portion of the Toledo SMSA (Monroe County) all experienced growth rates in excess of the rate of natural increase, thus indicating growth through migration as well as through natural population increase. The key distinction between these two groups of metropolitan areas is that the first (outmigration SMSAs) is extensively industrialized and largely dependent on the automobile industry; the second (inmigration SMSAs), while also industrialized, has more diversified economies. The latter SMSAs include university and government centers in Ann Arbor, Lansing, and East Lansing as well as extensive commercial, service, and manufacturing sectors not directly related to the auto industry in Grand Rapids and Kalamazoo.

Michigan in 1980 remains a heavily urbanized state in which eight of every ten residents live within one of the state's twelve metropolitan areas. Nonetheless, there have been significant changes in this pattern. Since 1970, the entire population of all metropolitan areas in Michigan went from 7,354,147 to 7,469,991, an increase of 116,000 or 1.6 percent. As discussed in the preceding section, this minimal growth implies a considerable amount of net outmigration from metropolitan areas during the ten-year period. The loss through migration occurred primarily in the counties where the central cities of metropolitan areas are located. In comparison, fringe counties—SMSA counties that do not contain central cities—have grown by more than 15 percent since 1970. This increase in SMSA fringe areas, however, did not compensate for the loss through migration from central SMSA counties.

POPULATION CHANGE IN NONMETROPOLITAN AREAS

It is evident that some of this migration has been directed toward Michigan's nonmetropolitan cities, towns, and rural areas. Nonmetropolitan areas in Michigan grew by 239,921 persons, a 15.6 percent increase, between the two censuses. By applying a natural increase rate of 6.9 percent for nonmetropolitan areas since 1970, we see that the total 15.6 percent increase in population suggests a substantial amount of net migration to these areas.[3] Thus, it appears that the nationwide turnaround from nonmetropolitan decline to nonmetropolitan growth, as suggested by Calvin Beale (1975), has been significant in Michigan. However, the growth rates vary from place to place. Patterns can be seen more clearly if we divide nonmetropolitan areas into three groups: (1) all nonmetropolitan counties in the southern half of the lower peninsula

[2]The estimated natural population increase for Michigan's SMSAs between 1970 and 1980 is 7.8 percent. This is derived from 1,175,000 estimated births and 600,000 estimated deaths during the past decade divided by the 1970 metropolitan population of 7,354,147. Any SMSA that grew by more than 7.8 percent between 1970 and 1980 is assumed to have experienced more inmigration than outmigration. Those that grew at a lower rate experienced net outmigration during the past ten years, offset only partially by natural population increase.

[3]The natural increase of 6.9 percent for nonmetropolitan areas is derived from estimated births of 265,000 and estimated deaths of 160,000 in nonmetropolitan areas between 1970 and 1980, divided by 1970 population, 1,527,679.

TABLE 1
The Population of Michigan by County and Components of Change: 1970–1980

County	1980 preliminary	1970 census	Change 1970-1980		Components of change			
			Number	Percentage	Births*	Deaths*	Net migration Number	Net migration Percentage
Alcona	9,719	7,113	2,606	36.6	1,019	1,140	2,727	38.3
Alger	9,220	8,568	652	7.6	1,318	1,030	364	4.3
Allegan	81,318	66,575	14,743	22.1	12,262	6,023	8,503	12.8
Alpena	32,238	30,708	1,530	5.0	4,884	2,705	−649	−2.1
Antrim	16,166	12,612	3,554	28.2	2,275	1,641	2,921	23.2
Arenac	14,752	11,149	3,603	32.3	2,060	1,413	2,956	26.5
Baraga	8,480	7,789	691	8.9	1,324	1,000	367	4.7
Barry	45,755	38,166	7,589	19.9	6,411	3,591	4,769	12.5
Bay	119,849	117,339	2,510	2.1	19,192	9,706	−6,975	−5.9
Benzie	11,165	8,593	2,572	29.9	1,425	1,218	2,366	27.5
Berrien	170,897	163,940	6,957	4.2	29,357	15,414	−6,986	−4.3
Branch	40,105	37,906	2,199	5.8	6,000	3,775	−25	−0.1
Calhoun	140,788	141,963	−1,175	−0.8	22,580	12,946	−10,810	−7.6
Cass	49,514	43,312	6,202	14.3	7,136	4,057	3,123	7.2
Charlevoix	19,892	16,541	3,351	20.3	2,912	1,852	2,291	13.9
Cheboygan	20,605	16,573	4,032	24.3	3,035	2,017	3,014	18.2
Chippewa	28,964	32,412	−3,448	−10.6	6,371	2,948	−6,872	−21.2
Clare	23,834	16,695	7,139	42.8	2,865	2,367	6,641	39.8
Clinton	55,715	48,492	7,223	14.9	8,176	3,240	2,288	4.7
Crawford	9,475	6,482	2,993	46.2	1,292	851	2,552	39.4
Delta	38,963	35,924	3,039	8.5	6,001	4,052	1,090	3.0
Dickinson	25,777	23,753	2,024	8.5	3,295	3,064	1,793	7.6
Eaton	88,177	68,892	19,285	28.0	11,304	5,063	13,044	18.9
Emmet	22,792	18,331	4,461	24.3	3,184	2,021	3,299	18.0
Genesee	450,343	445,589	4,754	1.1	78,075	32,652	−40,669	−9.1
Gladwin	19,830	13,471	6,359	47.2	2,383	1,749	5,726	42.5
Gogebic	19,617	20,676	−1,059	−5.1	2,507	3,032	−534	−2.6
Grand Traverse	54,698	39,175	15,523	39.6	7,427	3,903	11,999	30.6
Gratiot	40,425	39,246	1,179	3.0	6,764	3,563	−2,022	−5.2
Hillsdale	42,152	37,171	4,981	13.4	6,217	3,645	2,410	6.5
Houghton	37,839	34,652	3,187	9.2	5,030	4,760	2,916	8.4
Huron	36,422	34,083	2,339	6.9	5,614	4,102	827	2.3
Ingham	272,288	261,039	11,249	4.3	44,547	16,525	−16,772	−6.4
Ionia	51,670	45,848	5,822	12.7	8,433	4,204	1,593	3.5
Iosco	28,273	24,905	3,368	13.5	5,497	2,569	439	1.8
Iron	13,607	13,813	−206	−1.5	1,532	2,106	368	2.7
Isabella	53,943	44,594	9,349	21.0	7,168	3,018	5,199	11.7
Jackson	151,324	143,274	8,050	5.6	22,543	12,686	−1,807	−1.3
Kalamazoo	211,921	201,550	10,371	5.2	30,132	13,903	−5,857	−2.9
Kalkaska	10,926	5,372	5,554	103.4	1,514	911	4,950	92.2
Kent	444,030	411,044	32,986	8.0	70,815	34,649	−3,181	−.8
Keweenaw	1,964	2,264	−300	−13.3	272	349	−223	−9.9
Lake	7,801	5,661	2,140	37.8	973	1,101	2,268	40.1
Lapeer	69,992	52,361	17,631	33.7	10,421	4,443	11,653	22.3
Leelanau	13,986	10,872	3,114	28.6	1,626	1,227	2,715	24.9
Lenawee	89,986	81,951	8,035	9.8	14,667	7,267	635	0.8
Livingston	100,260	58,967	41,293	70.0	11,569	4,989	34,713	58.9
Luce	6,659	6,789	−130	−1.9	1,021	735	−416	−6.1
Mackinac	10,193	9,660	533	5.5	1,454	1,145	224	2.3
Macomb	694,458	626,204	68,254	10.9	96,277	40,012	11,990	1.9
Manistee	22,992	20,393	2,599	12.7	2,902	2,627	2,324	11.4
Marquette	74,115	64,686	9,429	14.6	12,801	5,394	2,023	3.1
Mason	26,343	22,612	3,731	16.5	3,476	2,592	2,846	12.6
Mecosta	36,925	27,992	8,933	31.9	4,680	2,443	6,696	23.9
Menominee	26,224	24,587	1,637	6.7	3,526	2,812	923	3.8
Midland	73,672	63,769	9,903	15.5	11,236	4,002	2,669	4.2
Missaukee	9,997	7,126	2,871	40.3	1,435	888	2,323	32.6
Monroe	133,524	119,215	14,309	12.0	20,105	8,974	3,178	2.7
Montcalm	47,532	39,660	7,872	19.9	7,561	4,425	4,736	11.9
Montmorency	7,467	5,247	2,220	42.3	945	839	2,114	40.3
Muskegon	157,103	157,426	−323	−.2	25,733	13,598	−12,458	−7.9

TABLE 1 (Cont.)

County	1980 preliminary	1970 census	Change 1970-1980		Components of change			
			Number	Percentage	Births*	Deaths*	Net migration Number	Net migration Percentage
Newaygo	34,864	27,992	6,872	24.6	5,010	3,135	4,998	17.9
Oakland	1,013,473	907,871	105,602	11.6	137,100	65,284	33,786	3.7
Oceana	21,865	17,984	3,881	21.6	3,465	2,075	2,491	13.9
Ogemaw	16,439	11,903	4,536	38.1	2,114	1,838	4,260	35.8
Ontonagon	9,832	10,548	−716	−6.8	1,594	1,225	−1,085	−10.3
Osceola	18,879	14,838	4,041	27.2	2,904	1,863	3,000	20.2
Oscoda	6,843	4,726	2,117	44.8	753	781	2,140	45.3
Otsego	14,983	10,422	4,561	43.8	2,208	1,067	3,421	32.8
Ottawa	156,975	128,181	28,794	22.5	23,283	9,103	14,615	11.4
Presque Isle	14,217	12,836	1,381	10.8	2,049	1,342	674	6.3
Roscommon	16,324	9,892	6,432	65.0	1,688	1,830	6,574	66.5
Saginaw	227,862	219,743	8,119	3.7	39,296	17,721	−13,457	−6.1
St. Clair	138,685	119,280	19,405	16.3	20,850	12,358	10,914	9.2
St. Joseph	55,917	47,392	8,525	18.0	8,850	4,943	4,618	9.7
Sanilac	40,729	35,181	5,548	15.8	6,072	4,081	3,557	10.1
Schoolcraft	8,574	8,226	348	4.2	1,301	1,114	162	2.0
Shiawassee	71,136	63,075	8,061	12.8	11,790	5,192	1,463	2.3
Tuscola	56,843	48,603	8,240	17.0	8,850	4,486	3,876	8.0
Van Buren	66,696	56,173	10,523	18.7	10,415	5,904	6,011	10.7
Washtenaw	261,405	234,103	27,302	11.7	37,708	13,048	2,642	1.8
Wayne	2,324,697	2,670,368	−345,671	−12.9	404,393	247,840	−502,210	−18.8
Wexford	24,992	19,717	5,275	26.8	3,684	2,368	3,959	20.1
Michigan Total	9,236,891	8,881,826	355,065	4.0	1,439,904	759,551	−325,289	−3.66

*The number of births and deaths are derived from reported vital statistics released by the Department of Public Health between 1970 and 1979. For 1970 births and deaths, three-quarters of that year's total amount are used as the period between April 1, 1970, through December 31, 1970. The 1980 births and deaths are an extrapolation of the 1979 data by taking one-quarter of the amount.

from Bay County to Oceana County (southern lower Michigan); (2) all counties in the lower peninsula north of this line (northern lower Michigan); and (3) the counties of the Upper Peninsula.

The northern lower peninsula gained about the same number of people as the southern lower peninsula during the past ten years. This gain of 111,663 persons boosted the population of northern lower Michigan from 383,965 in 1970 to 495,628 in 1980, a 29 percent increase. This growth rate indicates a substantial influx of residents to the northern lower peninsula. We estimate that more than 80 percent of the growth to this area in the past ten years has been due to migration.[4] Nonmetropolitan areas in southern lower Michigan also gained population, but the growth rate was lower than in the northern lower peninsula. This area gained 111,877 persons or 13.3 percent in the past decade. The growth rate suggests some degree of net migration to the area although this is estimated to represent only about one-third of the total growth.[5]

Population growth in the Upper Peninsula during the 1970s was not spectacular (5.2 percent) nor was it spread evenly among the region's fifteen counties. Nonetheless, this growth is significant in that the Upper Peninsula had lost population steadily for fifty years until this turnaround during the past decade. Between 1970 and 1980, the Upper Peninsula gained 15,681 people, mainly in the central portion, where Marquette County added 9,429 residents (14.6 percent). Several thousand more were added to Houghton, Alger, Menominee, Delta, and Dickinson counties. Even greater population growth had been expected to result from the rural revival of the 1970s, but several events hurt the economy of the Upper Peninsula. The closing of Kincheloe Air Force Base near Sault Ste. Marie led to the loss of several thousand military personnel and their dependents from Chippewa and Luce counties during the past three years. Layoffs at the White Pine mine in the western Upper Peninsula affected the populations of Gogebic, Iron, and Ontonagon counties. These losses, however, were offset by increases in retirement to the Upper Peninsula, tourism, college enrollments, and the expansion of the timber and wood pulp industries.

CONCLUSIONS AND DISCUSSION

The preliminary census count of Michigan's population in 1980 is very close to what was estimated in the *Economic Report of the Governor* (1980), which shows 9.24 million. The overall trends for counties, major cities, and geographic areas (metropolitan versus nonmetropolitan) are also close to what was expected. Several conclusions can be derived from the preliminary count of the 1980 census of population in comparison with the 1970 census.

Population growth in Michigan has been lower during the past ten years than in previous decades, and it has been lower than the national rate. The proportion of the U. S. population residing in Michigan also decreased. Approximately 4.4 percent of the U. S. population resided in Michigan in 1970; in 1980 the proportion is approximately 4 percent. This slackening of growth is due pri-

[4]Based on estimated births of 68,500 and estimated deaths of 46,700 between 1970 and 1980 in the northern lower peninsula, net migration was about 90,000 in the ten-year period.

[5]For nonmetropolitan areas in southern lower Michigan, the number of births was estimated to be 147,000 and the number of deaths about 78,000 between 1970 and 1980. The net migration was about 43,000.

marily to population loss in metropolitan areas, especially in and around their central cities.

Despite the overall slowing of population growth in Michigan, nonmetropolitan areas have been gaining population at astonishingly fast rates. The growth of population in Michigan's nonmetropolitan areas accounts for 68 percent of the total in the state. Counties in the northern lower peninsula gained population at particularly fast rates, while nonmetropolitan areas in the southern lower peninsula grew at more moderate rates. Although the Upper Peninsula has revived in population growth after long-term population loss in previous decades, this has taken place at a relatively slow rate.

Although Michigan's nonmetropolitan rate of growth outpaced that of the state's various metropolitan areas, the amount of growth and the number of people residing in rural areas remain relatively small. Even with the spectacular increase in the northern lower peninsula, the total population of the nonmetropolitan parts of Michigan is still less than 20 percent of the state's population. The gain in nonmetropolitan areas throughout Michigan has not compensated for the decline experienced in its metropolitan areas. Nonetheless, this pattern of growth is significant and bears further examination.

Common wisdom attributes much of the growth in northern and rural areas to retirement migration from older industrial areas in southern Michigan. Paul R. Voss and Glenn V. Fuguitt's (1979) examination of migration to the upper Great Lakes region confirms that almost one-half of the families moving to the region have household heads over the age of 50 and that most have moved from metropolitan areas in the lower Great Lakes basin. Migration from Detroit alone accounted for 44 percent of the migration from southern Michigan industrial areas. There is evidence that this movement toward metropolitan deconcentration is partly a function of growing economic opportunities in less-populated areas. John M. Wardwell and C. Jack Gilchrist (1980) have documented an employment turnaround in nonmetropolitan areas to accompany the one in population. They indicate this is due in part to changes in the employment structures of both the large metropolitan areas and the small nonmetropolitan areas.

Although population growth in Michigan's nonmetropolitan areas can be attributed to significant movement from metropolitan areas in the state, these gains do not fully offset the decline in Michigan's metropolitan areas. It is generally believed that there has been substantial migration from Michigan to other states. In fact, there is at all times substantial movement into and out of Michigan as well as all other states. Population estimates produced last year (FSCP, 1979), however, indicate that Michigan had 298,000 more outmigrants than inmigrants between 1970 and 1979. More specific analysis of Internal Revenue Service data by Richard A. Engels and Mary Kay Healy (1980) indicate that between 1978 and 1979 more than 10 percent of outmigrants from Michigan moved to California or Florida. Although Michigan received migrants from other states such as Ohio and Illinois, the net loss during this period was about 41,000 people.

As the structure of the American economy continues to change, and as Michigan continues to suffer extraordinary rates of unemployment because of these structural changes, the patterns of population change and movement described here are likely to continue. Undoubtedly, when recovery finally occurs in Michigan, more automobiles will be manufactured. However, increased automation of the manufacturing process and the shift toward smaller vehicles will mean fewer workers. Deconcentration of components manufacturing and increased foreign components purchases will also diminish the demand for industrial labor in Michigan. Moreover, the increased reliance on microprocessors to replace mechanical control devices in automobiles, the one bright area of growth in the auto industry in the near future, will probably provide little benefit for Michigan. These products are produced mainly in California, Texas, the Pacific Northwest, and the high-amenity areas of Colorado, Idaho, and Utah.

Michigan's metropolitan areas also lag in the development of the fast-growing service and high technology sectors of the economy. Thus, it is likely that Michigan's colleges and universities will continue to produce high quality engineers, technicians, and other skilled workers who will be forced to seek work elsewhere. The one optimistic note is that the more diversified economies of, say, Ann Arbor and Grand Rapids, and the high-amenity areas to the north could capitalize on these trends and become Michigan's growth centers of the future.

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DIVERSIFYING THE MICHIGAN ECONOMY

by JOHN F. HANIESKI, *Economist, member of the Michigan Industrial Developers Association*

In the recession year 1958, Cecil M. Birch published a paper, "Can Detroit's Economy Be Diversified?" It examined the proposition that the automobile industry establishes an environment that strangles most other businesses. The paper ends with a series of questions still asked today: "What types of diversification will reduce the impact of recessions? To what extent can diversification be achieved by working with companies already present in the area? Are total labor costs an obstacle to diversification? What obstacles are there to diversification other than labor costs: taxes, availability of materials, markets, plant sites? What are the prospects of the auto industry? Is the influence of the auto industry in Flint, Jackson, Lansing, Saginaw and Muskegon, and other automotive centers of Michigan less important than it is in Detroit?"

Over the next two decades, four basic approaches to diversification were variously emphasized and continue to be pursued today. One reduces the costs of doing business through changes in taxation, financial structures, and regulatory requirements. Another improves the perception of Michigan as a place to do business. The third promotes economic development research projects, including studies of specific industries, the business climate, and economic development strategies. The fourth fosters specific marketing programs, such as target industries, site development, and prospect assistance.

Michigan has had a long history of studies of the economy. Many good ideas and programs have been tried over the years with varied success. A number of these are particularly relevant to the effort to diversify and expand the economy as it relates to technology based industry. Some of these are discussed below.

1959—THE MICHIGAN ECONOMY

A 1959 report authored and edited by William Haber, Eugene C. McKean, and Harold C. Taylor contained contributions from the best and brightest of Michigan's economic establishment. It built upon the work of the Advisory Committee on Industrial Expansion Research, Michigan Department of Economic Development. Established in August 1956, the committee was chaired by Harold C. Taylor, director of research, Upjohn Institute.

The report documented the state's employment problem and the factors contributing to its economic difficulties. There had been a severe decline in employment since 1953, a recession in 1958, and a fiscal crisis at the end of the decade. Reasons cited were industry mix, shifts in defense procurement, decentralization of the automobile industry, and automation.

A fourteen-point program of action and study was recommended. It was suggested that "a responsible official agency of the state government, combining in its membership leaders of management, labor, and the general community," was essential to implement the program. The authors noted that the Committee on Michigan's Economic Future (COMEF) might effectively implement the recommendations.

The program advised a stepped up industrial promotion effort, including additional resources for the Department of Economic Development. Specifically, institutional advertising of Michigan as a site for industrial

location was urged. There also was an admonition to stop minimizing Michigan virtues and exaggerating its problems. The report recommended adopting the Economic Growth Act of 1960, modeled on the federal Full Employment Act of 1946, to establish a Council of Economic Advisors and a legislative Joint Economic Committee and to require annual economic reports by the governor and joint committee. A constitutional revision was viewed as imperative. A full-scale research effort was called for to determine the industries for which Michigan was most suited, especially "research centered, technology centered new products" and tourism. A vague call for the growth and stabilization of existing firms was made. A study of industrial location determinants was recommended to aid targeting industrial promotion efforts. The report also called for an "all out study and action program designed to bring Michigan's transportation system up to a condition of complete adequacy." The ninth recommendation was to set up an exploratory committee to consider efforts to take advantage of Michigan's water resources. The report cited a need for a comparative study of the conditions of doing business in Michigan as opposed to other states. The effect of taxes on business costs were to be thoroughly examined. Various financial inducements, such as development credit corporations, a statewide finance authority, and small business investment companies, were to be studied. Communities were to be encouraged to take steps to attract industrial growth. Finally, a special study of the characteristics of the unemployed was requested.

The suggested implementation agency, COMEF, was headed by William M. Day, chairman of the state Economic Development Commission, Department of Economic Development. Shortly after the report was released, Day asked Taylor to follow up by examining the tax question. Paul McCracken was tapped to direct a study by the nation's leading public finance experts. The result was *Taxes and Economic Growth in Michigan*, published in 1960.

While the various experts differed on details, they did agree on five points. First, fiscal questions had to be settled, in order to stop the recurrent financial crises that cause negative business attitudes and a lack of business confidence in the future. Second, too much fiscal legislation was frozen in the constitution. Third, taxes on business were relatively heavy. Fourth, Michigan needed a personal income tax. Finally, constitutional earmarking of sales tax revenues had to be removed.

Simultaneously, Lieutenant Governor John B. Swainson asked William Haber to convene a group of distinguishd Michigan economists to recommend policies. In late October 1960, they presented an eleven-point program. (1) Establish a strong financial base for state government through enactment of a state income tax. (2) Revise the tax system to reduce business taxes. (3) Undertake a detailed study of hard core unemployment to recommend specific measures designed to alleviate the problem. (4) Convene a governor's conference on automation to assess the effect of technological change and to consider ways and means of coping with the effects on Michigan employment. (5) Improve and increase enforcement of the state's fair employment practices act. (6) Establish a labor–management relations advisory committee and hold periodic meetings of labor and business leaders for discussion of mutual problems. (7) Increase substantially public and private expenditures for higher education and research at educational facilities throughout the state. (8) Improve development of facilities related to the St. Lawrence Seaway through a coordinated program of state, local, and private efforts. (9) Enlarge programs of urban redevelopment, particularly in Detroit. (10) Promote the vacation and resort industries through enlargement of the state park system and establishment of a large wilderness area in the Upper Peninsula. (11) Pass an Economic Development Act and establish a Council of Economic Advisors to the governor and the legislature.

1957–1963—MICHIGAN INDUSTRIAL AMBASSADORS

The admonition to improve the perception of Michigan's business climate was first met through a program called Michigan Industrial Ambassadors. Established about 1957, it reached its apex under Governor Swainson and Roblee B. Martin, who was president of Dundee Cement Company and chairman of the executive committee of MIA. As a 1961 press release stated, "the Industrial Ambassadors are top Michigan industry and business executives organized by the Michigan Economic Development Department to be on the lookout throughout the country for new industries and more jobs for Michigan." Approximately 275 executives were enthusiastically involved. In its brief tenure there were some small successes but no major relocations. The program was terminated by Governor George Romney in 1963.

LEGISLATIVE ACTIONS

In terms of changing the legal basis of the business climate, the most significant event was the constitutional convention of 1961–1962. It resulted in major changes in the tax structure, required a balanced budget, and reorganized state government. In 1963, Act 62 established industrial revenue bond financing — an important development tool. Over the next decade, other statutes were enacted; these are discussed below in the context of other initiatives. Act 20 and Act 125 of 1973 established a credit against the corporate income tax for personal property taxes on inventories. The franchise fee was reduced by Act 125 in 1974. In that year, two statutes of extraordinary significance were enacted. Public Act 198 enabled local units of government to establish plant rehabilitation and industrial development districts; the municipality could grant a 50 percent property tax abatement on plant and equipment for up to twelve years. Act 338 created Economic Development Corporations (EDCs), which have significant powers to undertake economic development projects.

In 1975, the Division of Minority Business Enterprise gave statutory life to a program that had been federally funded. The Michigan Job Development Authority, a statewide agency with the power to sell revenue bonds, was established by Public Act 301. Act 197 allowed local units to establish downtown development authorities with even greater powers than EDCs for the purpose of renewing, expanding, and otherwise developing downtown areas. Public Act 228 of 1975 established the Single Business Tax (SBT), which marked the return to a value-

added tax reminiscent of the Business Activity Tax. SBT revenue was pegged at the level of the estimated 1976 yields of the taxes it replaced and incorporated the benefit of previous tax reductions. The taxes repealed were the corporate franchise tax (Act 230), corporate income tax (Act 233), local property taxes on inventory (Act 234, Act 235), and various taxes on specific industries such as banking and insurance. A major feature of the Single Business Tax, designed to encourage business expansion, is the allowance of a 100 percent write-off from the tax base of new capital expenditures made in Michigan. The resultant cash flow advantage to businesses was expected to result in substantially more favorable conditions for investment in the state.

Act 255 of 1978 allowed local governments to establish commercial redevelopment districts in which commercial firms may be granted a property tax reduction for one to twelve years for renovating existing commercial property or constructing new commercial property.

In 1976, a budget stabilization fund was created by Act 76, and in 1978 the Tax Limitation Amendment was passed as a ballot proposal. Both seek to control the growth of public expenditures.

A new approach to the organization of Michigan ports was enacted in 1978, supplementing Act 234 of 1925. Under Act 639, P.A. 1978, more comprehensive powers and duties were provided to port operators.

The Full Employment Act of 1978 (Act 609, P.A. 1978) required the governor to submit an annual plan to achieve full employment.

In 1979, Act 76 chartered the Business Development Corporation, a private corporation to provide equity and debt financing to new and existing businesses meeting certain requirements.

The most recent major legislative reform is Act 357, P.A. 1980, which amends the workers' compensation statute. It is the culmination of a ten-year effort to improve benefits and remove abuses.

1963–1969—STATE RESEARCH GRANTS

In the wake of recommendations from the various study groups, the legislature appropriated $1.4 million for state research grants for economic expansion between 1963 and 1965; Act 230, P.A. 1963, appropriated $750,000 for a state research fund, and Public Act 266 (1965) provided $650,000 to cover the cost of additional research projects. Following is the section of the two acts that specified the funds' administration.

> The state research fund created by this act shall be administered by the department of economic development. Moneys in this fund shall be used to make grants to state colleges and universities in this state for specific research projects. The department shall give public notice of the existence of the state research fund, its objectives and the requirements for participation. Interested institutions shall submit specific research proposals in any area which will be of immediate or long-range benefit to the economic development of this state. Upon receipt of proposals, the director shall submit them to the economic expansion advisory council for evaluation. The director shall submit the proposals to the governor accompanied by the recommendations of the council. Upon approval by the governor, the director shall present the proposed projects to the legislature. Upon approval by resolution of the legislature of any proposal, the director shall release the grant of funds to the institution in accordance with the accounting laws of the state. Not more than 30% of the state research fund shall be granted to any one institution. In considering proposals, priority shall be given to those proposals which do not require continuing grants and have prospects of receiving financial assistance from other sources.

Twenty-seven projects were undertaken. There was a long gestation period associated with most, and some, of course, had no issue. There were, however, some notable and long-term benefits. For example, an econometric model of the state was constructed that is still in use for revenue forecasting. Ore-Ida located a processing facility here, at least partly because of a potato processing study. The silvacultural studies led to the Jaako Pyory analysis that ultimately resulted in the Forest Improvement District Act of 1980. Other wood resource studies helped locate paper mills and plywood factories. Most of the other studies had some long-term benefit. Complementing this program, Congress passed the Technical Services Act (PI 89-182) in 1965, which provided funds to the state to supply scientific and engineering help to businesses through the universities.

CHANGES IN ATTITUDE

There were some surveys and studies that counteracted efforts to be positive about the state's business climate. In 1972, the Survey Research Center, University of Michigan, produced *Industrial Location Decisions in Detroit*, which documented some rather negative attitudes toward Michigan. In 1975, the Fantus Corporation, a leading industrial location consulting firm, ranked states according to their business climates. This report, prepared for the Illinois Manufacturers Association, placed Michigan last. A recent study by Alexander Grant and Company also ranked Michigan last. It can certainly be argued that the latter two studies were imprecise and even perverse in their methodologies. For example, market size and industrial infrastructure were neglected in the rankings. Nevertheless, people were left with the perception that Michigan had a terrible business climate.

There have been advertising campaigns responding to these attacks. The approaches varied from direct confrontation of the negative perceptions ("Why move to a state with strong unions, high taxes, and crummy weather?") to positive image building (moneybelt versus the sunbelt). The complete history of Michigan's economic development advertising strategies remains to be told.

There have also been a number of carefully constructed analyses of the advantages of Michigan for specific business operations. Some were commissioned as part of formal programs, such as the State Technical Studies Program, and some were done in-house by the Office of Economic Development, which produced the Volkswagen report. While this approach is very effective with individual prospects, it does not change public perception of the business climate.

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Michigan Economic Indicators

Item	Year previous of latest month	Previous month	Latest month
Manufacturing workers:			
Average weekly hours, Michigan	39.1	41.0	41.2 (Nov.)
Average weekly hours, U.S.	40.3	40.3	40.7 (Nov.)
Average hourly earnings, Michigan ($)	8.91	9.95	10.00 (Nov.)
Average hourly earnings, U.S. ($)	6.87	7.49	7.59 (Nov.)
U.S. motor vehicle production (units)	696,353	612,398	603,277 (Jan.)
Michigan electricity usage (mil. kwh.)	5,763	5,860	5,714 (Nov.)
Industrial (mil. kwh.)	2,711	2,762	2,645 (Nov.)
Residential (mil. kwh.)	1,735	1,726	1,745 (Nov.)
Raw steel production:			
Michigan (000 net tons)	751	760	706 (Dec.)
United States (000 net tons)	9,996	10,057	10,180 (Dec.)
Consumer price index (1967 = 100)			
Detroit area	233.2	266.4	269.7 (Dec.)
United States	229.9	256.2	258.4 (Dec.)
U.S. wholesale price index (1967 = 100)	249.7	278.4	280.3 (Dec.)
Michigan farm prices received index (1967 = 100)	235	262	256 (Dec.)

SOURCES: U.S. Bureau of the Census; U.S. Bureau of Labor Statistics; Michigan Crop Reporting Service; Motor Vehicle Manufacturers Association, Inc.; American Iron and Steel Institute; and Energy Information Administration.

1970—THE GOVERNOR'S SPECIAL ECONOMIC TASK FORCE

In 1970, Governor Milliken appointed a special economic task force, chaired by Richard E. Whitmer, director, Department of Commerce. It was composed of six department directors and agency heads. The staff interviewed twenty-four prominent individuals from the academic community, organized labor, the automotive industry, the business and financial community, and state government.

The short-term proposals included legislation to extend unemployment benefits, accelerate state construction projects, increase bonding authority of the State Housing Development Authority, establish funds to employ disadvantaged youths in environmental improvement projects, establish training programs for disadvantaged persons, support federal assistance in funding on-the-job training programs, increase funding for the Aid to Dependent Children program, fund projects with recreation bonds, speed up the implementation of the Work Incentive Program, change the usury law, urge the state treasurer to deposit more funds in Michigan banks, and seek preferential consideration for Michigan in the allocation of federal funds for job-producing projects.

The long-range recommendations included actions to elevate the economic development function, improve purchasing practices, establish a Washington office, and seek greater diversification. Concerning this last, the specific actions were to examine the effect on Michigan of Canadian-U.S. trade patterns and the need for additional financial incentives for industrial locations.

1975—MICHIGAN ECONOMIC ACTION COUNCIL

In 1975, a unique group was formed: the Michigan Economic Action Council (MEAC). One-third of the membership was named by the speaker of the house; one-third by the senate majority leader; and one-third by the governor. The budget was similarly allocated. The twenty-nine-member council, chaired by W. Michael Blumenthal, issued a report on 27 August 1975 that contained twenty recommendations for short-term action. They addressed automotive industry employment, federal funding of public works, recreation and tourism, energy and utilities, railroad reorganization, income maintenance, and a program for implementing these recommendations.

On 1 June 1976, *Toward Growth with Stability: Recommendations for Long-Term Action* was issued. The recommendations (abbreviated by this author) follow:

1. Therefore, we recommend that the Single Business Tax be completely reviewed to determine if it should be restructured to encourage the growth sectors of the economy.
2. Therefore, we recommend that the Office of Economic Expansion review its activities so as to direct more of its attention to new service and high technological content industries.
3. We recommend the creation of a New Business Development Corporation designed to provide venture capital in the State of Michigan, and involving the financial resources of both state government and private institutions.
4. We recommend that the initial unemployment insurance contribution rate assigned to new employ-

ers by the Michigan Employment Security Commission be reduced from 2.7% to 1% when the question of debt repayment has been resolved.

5. Therefore, we recommend that Michigan law be amended to allow the state government pension fund to purchase SBA-guaranteed loans.
6. We recommend that the Michigan Department of Commerce plan and implement a program of direct technical and management assistance to small businesspersons located throughout Michigan.
7. We recommend that a Budget Stabilization Fund be created.
8. Therefore, we recommend that an appropriate means be established whereby the State can finance capital projects through the issuance of long-term debt in order to continue its construction program and maintain jobs during recessionary periods.
9. The Council recommends that the Public Service Commission and other agencies be mandated to develop policies designed to restrain demand and encourage conservation of electrical energy.
10. The Council recommends that Public Service Commission procedures be reviewed in an attempt to reduce time lags on petitions for rate increases.
11. The Council recommends that the Public Service Commission and other state agencies develop programs designed to restrain demand and encourage conservation of natural gas.
12. The Council recommends that Michigan should intensify its attention to development of state-owned natural gas reserves.
13. We recommend that the Governor and the legislative leaders seek an appropriate funding mechanism for mass transportation applicable on a regional basis, and for southeastern Michigan in particular.
14. We recommend that the Governor and legislative leaders assign the highest priority to the establishment of a comprehensive plan for preserving as much rail service as is both desirable and practical.
15. The Council recommends the creation of a State Port Authority charged with responsibility for promoting Michigan ports, seeking federal assistance for port improvements, and overseeing the development of all Michigan ports in cooperation with local governments and local port districts.
16. We recommend that the State adopt a land use policy that recognizes the need to bank to preserve land for future agricultural, industrial, and transportation use in special situations.
17. Therefore, we recommend that the State empower the City of Detroit to hold a referendum on the establishment of legalized casino gambling in the City of Detroit.
18. We recommend that the Michigan Travel Bureau incorporate into its activities the creation of new events and destinations, promotional tours and an outreach program to ensure that people who come in frequent contact with travelers provide the friendly welcome and professional services that are expected.
19. We recommend that the State encourage the establishment of joint labor-management economic development councils in cities throughout Michigan.
20. We recommend the creation of an Economic Advisory Council, to be jointly apponited by the Governor, the Speaker of the House, and the Senate Maority Leader on a non-partisan or bi-partisan basis, and charged with the responsibility of providing ongoing analysis and policy recommendations on Michigan's economy.
21. Therefore, we recommend that an Institute for Economic Development be created to provide long-range state economic information and projections, support for research related to the development of new industries, and a closer relationship between our higher educational institutions and the private sector.
22. Therefore, we recommend that an appropriate state government agency be vested with the responsibility of prescribing statistical standards relating to the quantity and quality of statistical data generated by legislative and executive agencies, including special surveys and censuses.
23. We recommend that the Institute for Economic Development, or some other state supported agency, assume responsibility for a continuing study of each of the distinctive economic regions of the State.
24. Therefore, we recommend that the Office of Economic Expansion collect and package information for prospective new employers on a regional basis.

1976—MICHIGAN'S CHANGING ECONOMY

In 1976, the Economic Development Administration, U.S. Department of Commerce, awarded a grant to the Michigan Department of Commerce to study Michigan's changing economy. A series of studies were undertaken and are listed in the bibliography. Most notable was the McKinsey study on target industries, which validated the approach taken by the Office of Economic Development and provided documentation needed to expand the target marketing approach.

1980—SPECIAL HOUSE COMMITTEE ON JOB DEVELOPMENT

In 1980, a special report, *Job Development in Michigan*, was issued by the Special House Committee on Job Development. The committee issued fourteen recommendations grouped into three areas—planning, targeting, and assistance. The report stated that development policies should be formed in the context of predetermined socio-economic objectives, that certain industries such as robotics hold more hope than others for Michigan, and that the state must play a more assertive role in developing a comprehensive program of facilitating new business creation. Many of the recommendations reemphasized existing programs within the Office of Economic Development such as target marketing and the small business ombudsman.

TARGET INDUSTRIES

A key program in the effort to diversify Michigan is marketing the state's advantages for target industries. The program currently includes a number of industries considered high-technology oriented.

Robotics. Industrial robots and other automated production equipment provide one of the most significant opportunities to create high-technology manufacturing jobs in Michigan. Although applicable to a wide range of production processes in a number of industries, the largest and most rapidly developing market for robots is the automotive industry. Michigan's concentration of auto assembly plants and other machinery and durable goods indus-

tries provides ideal market proximity. In addition, the engineering and development of robotics systems is greatly facilitated by proximity to automakers' research centers, state universities, and the tremendous concentration of special tool and die design companies.

The state has prepared a report on Michigan's advantages for robotics production that is used for presentations to potential investors. The state has established a working relationship with the Robot Institute of America (RIA) in Dearborn to share technical and site location information in order to promote Michigan as a location for robotics manufacture, and Office of Economic Development representatives were actively present at the National Robots Conference sponsored by the RIA and Society of Mechanical Engineers. Similar relationships also exist with Michigan State University, The University of Michigan, and Wayne State University.

Plastics. The target market effort for plactic products builds on the long-term conversion by the auto industry to lightweight materials in order to cut vehicle weight and conserve fuel. Although the initial link to automotives is strong, diversification is achieved by the industry's ability to fashion a variety of industrial and consumer plastic products that are nonauto related.

A study was completed in 1978 on Michigan's advantages for plastics production facilities. It has been used in prospect presentations, at trade shows, and in direct mail campaigns. A mailing was sent to plastics companies in the United States soliciting their interest in the study, and several ads were placed in trade journals to heighten awareness of Michigan's advantages for this industry. Michigan's plastics companies are also assisted in finding nonauto markets for a diverse range of products.

The state has also solicited direct investment at national plastics trade shows sponsored by the Society of the Plastics Industry and has promoted plastics machinery exports at the "Plasticos '80" exhibition in Mexico City.

Electronics. Michigan's potential to attract high-technology electronics firms is based on both market proximity and the presence of technical support systems.

The state's auto industry, in moving toward the installation of sophisticated electronic control systems in new vehicles, presents a significant market for electronic components. In addition, the state's concentration of manufacturing provides significant opportunities to producers of electronic control systems and equipment for a wide variety of industrial processes.

Michigan's technically oriented university system; wide-ranging public and private research and development programs; skilled scientists, engineers, and support staff in the labor force; and high quality of life meet the major locational requirements of expanding electronics companies. Discussions are currently being held with business leaders in electronics to identify potential targets and develop strategies to attract them to Michigan.

Alternate (Solar) Energy Equipment. The term *alternate energy equipment* covers the entire range of industrial and consumer solar and wind energy devices and biomass conversion processes and equipment. Michigan's primary advantages in this area are its sizable industrial and consumer markets, tax credits for the installation of energy conservation equipment, production expertise, and capability in mass manufacture of durable goods.

In 1977, the state proposed to the federal government that Michigan be the location for the new National Solar Energy Research Institute (SERI). As a result of that proposal and the many advantages for solar energy development pointed out in it, Michigan, in partnership with Minnesota, became the site for a regional development center known as the Central Solar Energy Research Corporation (CSERC).

Other state involvement in alternative energy development includes the preparation of a report on Michigan's advantages for energy equipment manufacture and ongoing relationships among the Michigan Energy and Resource Research Association (MERRA), the Michigan Energy Administration, the Office of Economic Development, and state universities to establish cooperative solar energy technology development and dissemination. The state was recently represented at the Solar Energy Exposition and Trade Show.

Future involvement will continue to include site location presentations to major new firms in the alternate energy field and assistance to entrepreneurs. To date, the Office of Economic Development has worked on nearly a dozen locations in the alternative energy area.

Metalworking Machinery. Metalworking machinery manufacture includes industries producing machine tools, tools and dies, and accessory equipment; it constitutes the production backbone of all durable goods manufacturing. Michigan (and the entire northeast U.S. industrial corridor), with its large concentration of auto and other durable goods industries, is the largest market for metalworking machinery in the world. The increasing sophistication of numeric and computerized control systems for machine tools presents a high-technology opportunity for Michigan in this industry.

A report on the state's advantages for metalworking machinery manufacturing, expanding a previous study done in 1977, has been produced for client presentations, and promotional efforts continue throughout the United States, Europe, and Japan. Michigan has also been represented for a number of years at international machine tool trade shows sponsored by the National Machine Tool Builders Association and the Society of Manufacturing Engineers and at Intermexpo in Mexico.

The Office of Economic Development also assists the expansion of exports by Michigan-based metalworking machinery producers by conducting and/or participating in international trade missions and trade and catalog shows.

Bio-Medical Equipment. In 1975, a report entitled "Seventy-five Reasons to Consider MICHIGAN as a Location for the Manufacture of Bio-medical Equipment and Supplies" was prepared. A direct mail campaign was conducted to bring our advantages to the attention of the industry. The state has continued to promote this area, and recent follow-up research has confirmed that this high-technology industry may well merit additional documentation and promotional efforts.

Other target industries, such as food processing and forest products, have high-technology elements, such as

genetics, and some potential targets are still in the preliminary research stage, such as communications.

CONCLUDING REMARKS

Why have these efforts had such little apparent effect?

(1) *Timing:* The studies generally were issued during the period of recovery following a downturn. This lessened the sense of urgency felt during the recession. Attention turned to other matters, such as nonreturnable beverage containers.

(2) *Level of generality:* Most reports recommended goals rather than actions. It is far from easy to translate the goal of diversifying the economy into specific steps, such as changes in tax or banking laws.

(3) *Structural inertia:* Michigan's industrial endowment is massive. During prosperous times it provides high paying jobs, many of which require a moderate level of skills. This structure inhibits other industries from locating or expanding here. In addition, there are numerous vested interests that view change as threatening or unnecessary. For example, Michigan bankers have not seen a need to support entrepreneurship because there were three areas in which good loans could be made: The auto industry had a good payback record; tax anticipation notes were low risk; and agricultural loans involved dealing with familiar people in familiar ways. With these markets available, there was no perceived need to find ways to support innovation.

(4) *Planning is not implementation:* Most reports were conducted or sponsored by planning bodies. The implementation agencies had no real role in the analysis or the recommendations. Consequently, those expected to bring the goals to fruition had little or no commitment to the process.

(5) *Preeminence of short-term revenue concerns:* The major economic advisor to the legislature and the executive has been the Department of Management and Budget. Its primary concern is meeting the requirement of a balanced budget each fiscal year. Consequently, stimulative tax cuts and programs with long gestation periods were not suggested or supported.

In conclusion, Michigan has a long history of studies of the economy. Many good ideas and programs have been tried over the years with varied success. We do know what to do, what works, and how to make it work. What is needed is a long-term, institutionalized commitment to economic development. Perhaps the major lesson to be drawn was offered by President Calvin Coolidge, "Persistence is better than good luck."

A partial bibliography of the special studies done over the last two decades follows. It traces the mainstream (and a few tributaries) of economic development thought in the state. No offense is intended to authors overlooked.

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EXPANDING HIGH GROWTH, TECHNOLOGY-BASED INDUSTRY IN MICHIGAN

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In his State of the State Message, 15 January 1981, Governor William Milliken proposed an economic growth plan to help move Michigan out of the most trying economic situation it has faced since the Great Depression. Key points included several major initiatives to expand high growth, technology-based industry in the state. The Michigan Council of Professional Scientific and Technical Associations (MCPSTA) is eager to help the governor and the legislature implement these initiatives. Because most of the major engineering and technical societies in this state are members of MCPSTA and because these societies have nationwide contacts with prospective high technology industries that could make use of Michigan's unique natural and human resources, the council feels qualified to assist.

This article contains certain recommendations arrived at by a special MCPSTA task force composed of representatives from local high technology industry and from Michigan's major engineering schools. These recommendations expand on the governor's initiatives and also upon specific recommendations embodied in the Burkhalter report to the governor[1] and the somewhat similar Blumenthal commission report.[2] The need to attract high technology industry in order to diversify the Michigan economy has been well known for some time. For example, the Bacon study called for developing strong incentives for high technology industry to locate and grow here.[3] That study specifically cited those industries leading to manufacture of industrial, institutional, and consumer products that are largely electromechanical in nature, but also use some electronics. However, due to the strength of Michigan's automobile industry, no real efforts to nurture diverse high technology industry were made in the 1970s. It is hoped that our suggestions may be viewed as augmenting the governor's plan and the Burkhalter and Blumenthal reports. The fifteen MCPSTA recommendations are noted below.

(1) MCPSTA strongly endorses the governor's concept of a special planning body to develop an accelerated economic action plan. This body should be permanent and contain a full-time staff and board drawn from the private and public sectors and functioning in a role similar to that envisioned for the Institute of Economic Development described in recommendations no. 21, no. 22, and no. 23 of the Blumenthal report. The economic planning body could serve as the synthesizer of all economic data generated by the government, universities, and the private sector; conduct in-depth economic analyses; make policy recommendations; provide long-range economic information and projections; provide support for research related to the development of new industries matched to the state's resources; and provide a closer relationship between our higher educational institutions and the private sector oriented toward economic growth.

(2) MCPSTA also is convinced that an interdepartmental Job Development Coordinating Council, as recommended in the Burkhalter report, should be created. This council would be coordinated by the Office of Economic Development and would serve as the primary coordinat-

ing agency of the various state civil service offices and bureaus whose functions affect employment in Michigan. The council could also evaluate the effectiveness of PA 609 (1978), the Full Employment Act, and make a report to the governor and the legislature.

(3) MCPSTA views as desirable the establishment of a High Technology Educational Council consisting of the six major public engineering schools in the state (University of Michigan, Michigan State University, Wayne State University, Michigan Technological University, Western Michigan University, and Oakland University). This council would ensure that these universities meet the need of high technology industries for advanced continuing education courses and seminars, secure additional financial support for these universities from industry, and enhance joint cooperative research and development efforts between industry and academia. This cooperative effort could also include the rotation of engineering school faculty into industry and senior engineers from industry into academia on a cooperative basis.

(4) Implicit in the governor's State of the State message and in recommendations nos. 11–14 of the Burkhalter report is the assumption that Michigan's engineering universities have the laboratory and faculty capability to cooperate significantly with industry in such ventures as innovation centers or industrial parks. While perhaps true in the 1960s, this capability has severely atrophied in the last decade. Currently, Michigan's engineering schools do not have the faculty capability to develop programs in entrepreneurial studies or engage in any significant amount of industry consulting. Finally, due to lack of graduate students, this state's graduate schools are unable to meet the needs of high technology industry should it locate in Michigan. To rectify these shortcomings, MCPSTA offers three suggestions.

First, there should be increased accountability to the legislature by each of the state's public engineering schools with respect to how these institutions are satisfying the needs of current or prospective Michigan high technology industry. State funding can no longer be automatic for 11-plus engineering schools without some accountability. Furthermore, different disciplines—for example electrical, mechanical, computer, chemical, manufacturing, and so forth—should be emphasized by each of the major schools so that the best possible graduate program exists in at least one or two schools for each engineering discipline. Tax incentives such as credits and deductions for contributions aimed at establishing a laboratory or professional chair should be made available to industry.

Second, a statewide, two-way higher education cable TV network could link the major engineering universities with each other and with high technology industrial sites. This cable network could be via satellite and might also be used for business data communications (see below). Large, high technology companies employing a significant force of blue-collar workers are not going to East Lansing or Ann Arbor. Higher education in Michigan must be prepared to go to potential sites (Grand Rapids, Benton Harbor, Muskegon, Kalamazoo, and Traverse City on the western side of the state, for example). Funding for such a cable TV network could be arranged through state bonds and industrial contributions and use fees.

Third, additional funding should be granted the major engineering schools so that they may employ graduate students full time as teaching assistants at a salary level roughly 50 percent of the current wages being offered by industry to B.S. graduates. This would encourage many more bright students to stay in school and get an advanced degree. Tax credits for industrial contributions to fund additional graduate assistantships should be established. Financial support should also be sought from the National Science Foundation, as this is a national problem.

(5) While the Burkhalter report is correct (recommendation no. 3) in stating the importance of attracting high technology industries to the state, MCPSTA takes issue with the priorities listed in recommendation no. 5, which ranks the attraction of branch industries from outside the state much lower than the creation of start-up businesses within the state. In the high technology business sector, large size alone does not imply static growth. The number of employees working for IBM, Magnavox, TRW, Hughes, and so forth, has not remained fixed, but is growing constantly as these companies expand their technology base. Hence, a branch plant of an established high technology company should be courted as earnestly as the start-up of a new business. In the near term, high technology garage shops, even potential "Texas Instruments," will not adequately take up the employment slack in Michigan due to the contraction of the U.S. automobile industry. Only the infusion of large branch plants can do that within the next five years. It also can be expected that considerable spinoff of small firms will occur from large branch plants.

(6) MCPSTA recommends the establishment of a statewide cable business data communications network. This would permit data exchanges at video rather than long-line rates and would be most attractive to new business. The business data communications network could also serve as the two-way, high technology, educational TV network described above.

As part of the statewide data communications network, the Department of Commerce should set up a data bank of all potential customers for Michigan products, both domestic and international. Furthermore, the department should establish a capabilities data bank of Michigan industry to which potential customers could address inquiries. These customers would be aggressively sought by the Department of Commerce. Through MCPSTA, the professional, technical, and scientific community would assist the department in the creation of such a data

bank. Direct assistance from various industry groups would also be required. The availability of the data bank to Michigan business and potential customers must then be constantly publicized by the Department of Commerce.

(7) In addition to the high technology target industries listed by the governor and the Burkhalter report, sophisticated agricultural equipment and aircraft and defense equipment appear also to be good prospects for Michigan. High technology, agri-engineering equipment would seem to provide an ideal marriage of the state's automotive manufacturing capability to its second leading industry. Furthermore, the state's well-established agricultural engineering schools could play an important part in identifying marketable agri-engineering products to industry. High technology aircraft/defense equipment, including advanced airframes and armored vehicles, would also be good matches to Michigan's capability for heavy durable goods production. The state already has a fledgling aerospace industry, and this should be nurtured.

(8) MCPSTA recommends the governor appoint a committee to review the effect of PA 64 (1979), the Hazardous Waste Management Act, on Michigan industry and on attracting new industry to the state.

While MCPSTA supports the major provisions of the act, certain implementation rules appear to be in conflict with, or considerably in excess of, those of the National Resource Conservation Recovery Act. To the extent that such conflicting requirements only deter responsible high technology industry from moving to Michigan, some modification may be in order.

More generally, MCPSTA feels that Michigan must develop flexible environmental and waste management policies that can respond to changes in any nationally approved requirement. MCPSTA calls for tax incentives to encourage growth in the private sector of the hazardous waste reclamation industry and allied disposal facilities so as to meet the needs of Michigan and the Midwest.

(9) The New Business Development Corporation already approved by the legislature must be organized as soon as possible. This corporation and the technology-based Innovation Development Fund suggested by the governor would raise venture capital for new high technology businesses.

(10) MCPSTA recommends that the legislature approve state tax credits or at least deductions for documented research and development on potential new products, processes, or systems. (The results of the research need not be made public, of course, only the manpower and equipment costs.) An example of such a proposed federal tax credit structure is H.R. 7983 (VanderJagt and Pickle), which would provide a 25 percent tax credit for increases in research and development spending over the average annual research and development outlays of a firm for the previous three-year period. Another proposed federal tax incentive that could be implemented at the state level is H.R. 6632 (Vanik), which would provide a tax credit similar to that in H.R. 7983 to business firms that buy research at colleges and universities. The Michigan legislature might wish to restrict this research to that performed at in-state institutions.

(11) Similarly, MCPSTA recommends state tax credits for expenses incurred in filing patent applications. These credits would only be available to individuals or small businesses, however.

(12) MCPSTA recommends that a legislative committee be set up to monitor the effectiveness of the new Worker's Compensation and Unemployment Insurance Act in eliminating disincentives for high technology industry to locate in Michigan. Certain problems appear to exist in the functioning of the Board of Review brought about by the lack of computer aids to sort out the myriad of cases on file. MCPSTA will join with other groups in making recommendations to ease these administrative problems in the near future.

(13) MCPSTA strongly recommends that the state take advantage of federal matching funds to accelerate innovation. To this end, state funds or bonding approval should not be held up unduly; delays in innovative projects result in increased final costs due to the time value of money and, of course, do not help the current employment situation. The DOE/Michigan Regional Electric Battery Storage Project involving the Wolverine Electric Power Co-Op Company is an example of such a delay due to slow bonding approval by the Michigan Public Service Corporation.

(14) MCPSTA recommends that the solar tax credit be retained and even increased in amount to allow a faster payback than would be possible from placing the equivalent monies in long-term deposits. Similar credits should pertain for use of other forms of alternative energy sources. Extension of these credits will help the small but growing alternative energy industry in Michigan.

(15) MCPSTA strongly supports and will work with the governor and legislature in establishing a consistent Michigan energy policy. Such a policy would ensure that Michigan is able to guarantee a plentiful and economic supply of energy to all prospective industry. Furthermore, this policy would foster cooperation among public utilities, the Department of Natural Resources, and local communities and would avoid frustrating (and costly and nonproductive) construction delays such as those accompanying the Midland nuclear plant.

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Michigan Economic Indicators

Item	Year previous of latest month	Previous month	Latest month
Manufacturing workers:			
Average weekly hours, Michigan	42.0	40.9	42.6 (Dec.)
Average weekly hours, U.S.	40.9	40.2	40.8 (Dec.)
Average hourly earnings, Michigan ($)	9.07	9.99	10.30 (Dec.)
Average hourly earnings, U.S. ($)	6.97	7.59	7.69 (Dec.)
U.S. motor vehicle production (units)	791,521	602,777	613,274 (Feb.)
Michigan electricity usage (mil. kwh.)	5,763	5,860	5,714 (Nov.)
Industrial (mil. kwh.)	2,711	2,762	2,645 (Nov.)
Residential (mil. kwh.)	1,735	1,726	1.745 (Nov.)
Raw steel production:			
Michigan (000 net tons)	839	706	770 (Jan.)
United States (000 net tons)	10,701	10,180	10,590 (Jan.)
Consumer price index (1967 = 100)			
Detroit area	237.2	278.0	268.5 (Jan.)
United States	233.2	258.4	260.5 (Jan.)
U.S. wholesale price index (1967 = 100)	254.9	280.3	283.5 (Jan.)
Michigan farm prices received index (1967 = 100)	235	257	259 (Jan.)

SOURCES: U.S. Bureau of the Census; U.S. Bureau of Labor Statistics; Michigan Crop Reporting Service; Motor Vehicle Manufacturers Association, Inc.; American Iron and Steel Institute; and Energy Information Administration.

Contracts for Future Building, January 1980 and 1981

(Thousands of Dollars)

Area	Nonresidential			Residential			Total[a]		
	1979	1980	Percentage change	1979	1980	Percentage change	1979	1980	Percentage change
Ann Arbor	2,514	5,415	+ 115	1,816	5,809	+220	4,330	11,224	+159
Battle Creek	747	1,534	+ 105	518	592	+ 14	1,265	2,126	+ 68
Bay City	40	748	+1,770	252	226	− 10	292	1,010	+246
Detroit	54,121	55,477	+ 3	27,722	23,039	− 17	81,843	78,516	− 4
Flint	10,571	6,323	− 40	1,726	2,390	+ 38	12,297	8,713	− 29
Grand Rapids	40,432	5,379	− 87	7,105	4,410	− 38	47,537	8,789	− 79
Jackson	3,501	170	− 95	578	590	+ 2	4,079	760	− 81
Kalamazoo–Portage	1,577	910	− 42	3,167	1,369	− 57	4,744	2,279	− 52
Lansing–East Lansing	5,749	4,995	− 13	8,764	5,856	− 33	14,513	10,851	− 25
Muskegon–Norton Shores–Muskegon Heights	562	309	− 45	1,843	1,135	− 38	2,405	1,444	− 40
Saginaw	1,648	842	− 49	3,645	891	− 76	5,293	1,733	− 67
Michigan	130,443	85,089	− 35	75,551	54,757	− 28	205,991	139,846	− 32
United States	4,278,500	4,122,000	− 4	4,055,300	4,206,600	+ 4	8,333,800	8,328,600	—

SOURCE: F. W. Dodge Division of McGraw-Hill Information Systems Company, news releases.

NOTE: Battle Creek includes Barry and Calhoun counties; Detroit includes Lapeer, Livingston, Macomb, Oakland, St. Clair, and Wayne counties; Flint includes Genesee and Shiawassee counties; Grand Rapids includes Kent and Ottawa counties; Kalamazoo-Portage includes Kalamazoo and Van Buren counties; Lansing–East Lansing includes Clinton, Eaton, Ingham, and Ionia counties; and Muskegon–Norton Shores–Muskegon Heights includes Muskegon and Oceana counties.

a. Excludes nonbuilding construction contracts. This category comprises streets and highways, bridges, dams, reservoirs, river and harbor developments, sewerage and water supply systems, missile and space flight facilities, airports, utilities, and communication systems. For Michigan the 1980 and 1981 figures for nonbuilding construction contracts were $27,045,000 and $41,063,000 respectively, or an increase of 52 percent. U.S. figures for nonbuilding construction contracts were $2,606,700,000 and $2,138,700,000, or a decrease of 18 percent.

Year-to-Year Change in Selected Economic Indicators

Percentage change from previous year

Indicator	1980 Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	1981 Jan.
Civilian employment													
United States	+ 1.8	+ 1.6	+ 1.1	+ .9	+ .5	− .1	− .3	− .1	− .3	− .2	− .1	− .5	−
Michigan	− 2.1	− 3.1	− 4.3	− 4.4	− 7.3	− 6.5	− 7.3	− 4.1	− 5.1	− 5.2	− 5.7	− 4.5	− 3.8
Detroit area[a]	− 3.7	− 4.6	− 5.6	− 6.0	− 8.8	− 7.9	− 8.2	− 4.8	− 5.9	− 5.7	− 5.9	− 5.1	− 4.6
Outstate[b]	− .6	− 1.8	− 3.0	− 2.9	− 5.9	− 5.2	− 6.5	− 3.5	− 4.4	− 4.8	− 5.4	− 3.8	− 3.1
Wage and salary jobs[c]													
United States	+ 2.4	+ 2.3	+ 1.9	+ 1.7	+ .9	+ .1	− .2	−	+ .1	+ .2	+ .4	+ .5	+ .5
Michigan	− 2.9	− 3.5	− 3.8	− 4.9	− 7.0	− 6.9	− 7.2	− 4.8	− 4.8	− 3.9	− 2.5	− 2.5	− 2.0
Detroit area[a]	− 3.8	− 4.6	− 4.9	− 6.3	− 8.1	− 7.6	− 7.7	− 4.8	− 4.8	− 3.9	− 3.0	− 3.7	− 3.4
Outstate[b]	− 2.0	− 2.3	− 2.7	− 3.5	− 6.0	− 6.2	− 6.7	− 4.8	− 4.8	− 3.9	− 2.0	− 1.3	− .6
Average workweek[d]													
United States	− .7	− 1.0	− 2.0	+ 1.3	− 2.0	− 2.5	− 2.8	− 1.8	− 1.2	− 1.2	− .2	− .2	+ .3
Michigan	− 5.9	− 7.0	− 6.5	+ 6.4	− 6.4	− 5.5	− 3.6	− 2.2	− 1.2	+ .2	+ 5.4	+ 1.4	
Average weekly earnings[e]													
United States	+ 6.3	+ 6.1	+ 5.5	+ 9.6	+ 5.4	+ 5.3	+ 5.5	+ 7.0	+ 7.8	+ 8.3	+10.2	+10.1	+11.2
Michigan	− .6	− 1.5	+ .3	+14.6	− 2.2	+ 1.5	+ 3.4	+ 6.6	+ 8.9	+12.5	+18.3	+15.1	
Motor vehicle assembly													
United States	−38.2	−33.9	−36.6	−28.5	−50.2	−43.7	−48.2	−32.4	−17.6	−16.7	−13.4	+ .9	−13.4
Michigan	−40.7	−38.7	−49.7	−40.6	−62.1	−50.9	−54.4	−35.8	−20.1	−16.2	−19.7	+15.0	
General Motors	−24.0	−23.7	−45.0	−36.0	−60.9	−49.3	−44.9	−36.9	−22.7	− 9.2	−29.5	+ 8.3	
Ford	−52.7	−49.1	−47.2	−46.7	−54.1	−34.7	−69.0	−31.3	−15.7	−18.0	− 1.5	+42.8	
Chrysler	−77.5	−80.5	−74.0	−54.9	−77.1	−73.7	−86.2	−48.5	−16.5	+34.5	+ 5.2	+11.2	
Steel tonnage poured													
United States	− 3.6	− 2.2	− 9.0	−12.6	−27.9	−38.7	−42.5	−37.9	−26.3	−12.7	+ .6	+ 1.8	− 1.0
Michigan	−16.3	− 7.8	−20.7	−18.7	−42.9	−62.7	−54.8	−52.0	−33.4	−10.4	+ .8	− 6.0	− 8.3
Commercial electricity consumption													
United States	− 2.1	− .7	+ 1.7	+ 1.4	− .8	+ 1.1	+ 6.4	+ 7.9	+ 8.3	+ 4.3	+ 3.3		
Michigan	− 2.7	+ .7	+ .2	+ 3.9	− 2.8	− 4.4	+ 2.0	+ 4.6	+ 5.2	−	+ .1		
Industrial electricity consumption													
United States	− 1.0	+ 1.1	− 1.0	− 2.8	− 6.4	− 7.2	− 7.7	− 6.4	− 2.0	− 2.9	− 3.1		
Michigan	−16.0	−10.1	−14.7	−10.3	−26.1	−28.2	−19.8	−13.3	− 9.8	− 3.4	− 2.4		
Nonresidential construction contracts													
United States	+10	+12	+ 3	− 5	− 7	+ 6	+ 6	− 2	− 1	+ 6	+34	+37	− 4
Michigan	+28	−33	−24	+ 1	+15	+ 8	+31	−38	−41	+10	+100	+13	−35
Residential construction contracts													
United States	− 9	− 5	−34	−39	−44	−30	−11	−17	− 2	− 3	+24	+33	+ 4
Michigan	−27	−13	−37	−69	−55	−55	−37	−38	−22	+ 5	+ 8	+17	−28
Nonbuilding construction contracts													
United States	−20	−60	−36	−50	−33	−24	−41	+76	+ 3	−13	−26	−18	−18
Michigan	−76	−49	+28	−51	−41	−24	−29	− 8	+35	−11	+53	+13	+52
Retail sales													
United States	+12.1	+14.6	+ 3.5	+ 4.9	+ 4.3	+ 1.9	+ 9.2	+ 3.4	+ 5.4	+ 8.4	+ 4.8	+ 8.5	
Michigan	+ 8.9	+ 7.3	− 3.6	− 1.8	− 4.1	− 5.9	+ 6.1	− 2.4	+ 1.2	+ 3.6	− .7	+ 2.4	
Detroit area[a]	+ 9.6	+ 7.4	− 2.0	+ .1	− 4.0	− 4.0	+ 8.9	+ 1.5	+ 6.4	+10.4	+ 4.0	+ 5.2	
Detroit city	+20.0	+14.1	+ 4.6	− .7	− 6.8	−10.6	− 4.2	− 9.6	− 3.7	+ 1.0	−12.5	−12.1	
Suburbs	+ 7.5	+ 6.0	− 3.4	+ .2	− 3.4	− 2.6	+11.7	+ 3.7	+ 8.1	+12.2	+ 7.2	+ 8.4	
Outstate[b]	+ 8.0	+ 7.2	− 5.5	− 4.0	− 4.3	− 8.3	+ 2.8	− 6.7	− 4.6	− 3.9	− 6.4	− 1.2	
Consumer price index													
United States	+13.9	+14.1	+14.7	+14.7	+14.4	+14.3	+13.2	+12.8	+12.7	+12.6	+12.6	+12.4	+11.7
Detroit[a]	+15.7	+15.1	+14.8	+16.4	+16.1	+19.2	+15.6	+14.8	+16.0	+16.3	+15.2	+15.7	+13.2

SOURCE: Michigan Employment Security Commission, special release; Bureau of Labor Statistics, *The Employment Situation* (monthly); Motor Vehicle Manufacturers Association, special release; American Iron and Steel Institute, special release; Energy Information Administration, special release; F. W. Dodge Division of McGraw-Hill Information Systems Company, news releases (monthly); and Bureau of the Census, *Monthly Retail Trade*.

a. Wayne, Oakland, Macomb, Livingston, Lapeer, and St. Clair counties.
b. Michigan minus Detroit area.
c. The number of wage and salary jobs, except agricultural, reported by employers.
d. Average hours worked by manufacturing production workers.
e. Average earnings among manufacturing production workers.

Quarterly Motor Vehicle Employment and Assembly

Item	1978			1979				1980			
	2	3	4	1	2	3	4	1	2	3	4
EMPLOYMENT[a]											
Checker											
Michigan	1,118	1,084	1,140	1,207	1,194	1,182	1,099	982	803	735	882
Chrysler											
Michigan	82,799	75,187	81,664	75,316	70,238	58,182	55,456	47,273	43,235	40,733	44,452
United States	136,158	125,989	135,997	125,899	118,532	99,754	98,228	86,341	78,908	73,248	80,321
Ford[b]											
Michigan	127,148	126,300	135,377	132,298	129,526	117,630	111,790	104,321	92,458	86,528	100,033
United States	239,517	233,314	253,536	245,253	240,054	211,763	196,038	181,595	160,226	144,068	172,827
General Motors											
Michigan	278,000	267,000	289,000	295,000	296,000	291,000	288,000	267,000	237,000	220,000	253,000
United States	619,000	594,000	643,000	644,000	650,000	582,000	602,000	561,000	499,000	469,000	538,000
ASSEMBLY											
Dearborn	70,007	39,072	83,017	96,572	92,774	85,970	68,819	65,971	70,823	49,852	54,856
Detroit	140,723	54,857[c]	89,563[c]	130,475[c]	113,866[c]	56,399[c]	78,055[c]	57,044[c]	40,016[c]	32,540[cR]	102,410[c]
Detroit (truck)	11,443	11,142	30,753[c]	33,693[c]	28,503[c]	12,861[c]	16,534[c]	14,812[c]	5,865	1,687	4,717
Flint	104,042	76,157	109,192	115,405	110,135	56,914	90,222	69,179	65,568	54,201	71,213
Flint (truck)	116,436	103,549	104,839	114,846	95,075	60,985	75,541	70,123	19,975	12,605	68,449
Hamtramck	86,545	56,808	54,230	44,901	62,806	15,345	30,134	1,031[c]	c	c	c
Kalamazoo	1,036	809	1,019	1,134	1,268	1,203	1,161	770	810	762	855
Lansing	110,381	62,327	116,726	130,644	130,363	72,684	96,143	104,913	82,558	56,769	85,367
Pontiac	87,334	61,666	82,652	91,712	85,977	46,578	61,082	50,974	30,102	26,077	39,831
Pontiac (bus & truck)	67,569	61,741	72,398	77,144	73,922	51,628	42,135	33,850	24,376	21,831	21,295
Warren (bus & truck)	94,415	72,181	84,504	76,365	48,873	5,027	19,043	14,783	28,537	16,498[R]	17,363
Wayne	76,599	63,214	55,607	50,477	46,765	34,081	28,800	27,840	37,401	24,039	67,854
Wayne (truck)	56,436	48,390	52,388	56,052	51,994	21,305	34,256	25,355	7,751	11,890	21,362
Wixom	47,639	36,508	46,902	51,132	36,527	20,013	32,604	8,724	6,896	15,393	19,914
Ypsilanti	73,733	57,178	38,891	38,797	75,420	73,508	70,507	84,598	83,147	66,919	80,400
Total Michigan											
Passenger car	798,039	508,596	654,346	751,250	755,901	462,695	557,527	471,044	417,321	326,552[R]	522,700
Bus and truck	341,141	297,003	368,325	358,100	298,367	151,806	187,509	158,923	86,504	64,511[R]	133,186
Total United States											
Passenger car	2,656,507	1,850,701	2,398,411	2,411,307	2,482,907	1,655,546	1,884,756	1,783,732	1,632,826	1,259,897	1,697,792
Bus and truck	1,019,266	851,996	982,232	1,024,655	916,996	529,092	564,118	499,525	350,607	307,817	476,234
Total Canada											
Passenger car	345,842	229,593	297,157	307,823	281,806	171,427	227,966	225,969	228,428	162,183	228,393
Bus and truck	185,031	120,199	180,355	200,162	190,698	107,988	135,532	146,015	136,314	95,798	144,764

SOURCE: Ward's *Automotive Reports;* Motor Vehicle Manufacturers Association of the United States, Inc., P-I report; and companies.

a. Average monthly wage and salary employment of companies with assembly plants in Michigan; includes nonautomotive.

b. Excludes Ford Aerospace and Communications Corporation and finance and insurance subsidiaries.

c. Chrysler's Jefferson Avenue plant was converted to truck production in September 1978. It was returned to car production in August 1980 after having been closed since March 1980. Chrysler's Hamtramck plant closed January 4, 1980.

R: Revised.

Electronics and Education in the Midwest

by FREDERICK EMMONS TERMAN, *Stanford University*

In the last two decades electronics has become one of the most exciting industries of all time because of its diversity, the many challenges it offers, and its potential for spectacular growth. This situation has been brought about by a *new electronics* that originated about 20 years ago, based on sophisticated applications of recent developments in science and technology.

Education has an increasingly important role in the new electronics. To the individual, formal university training is essential because the concepts involved are too complex to be acquired by home study and on-the-job experience. A year of graduate training is almost a necessity for those who wish to participate in the technical aspects of the most promising areas, and a Ph.D. degree is desirable for the person who aspires to be an expert.

This means that the university is acquiring a new significance. Industry is discovering that for electronic activities involving a high level of scientific and technological creativity, it is more important to be located near an educational institution (a center of brains) than near markets, raw materials, suppliers, transportation, or factory labor. There are a number of reasons for this. Universities are the sources of the highly trained young people who represent the most important raw material going into creative electronics. Universities, through their research activities, are sources of ideas; a few of these are directly exploitable commercially, and others contribute to an understanding that stimulates innovation on the part of industry, particularly nearby industry. The faculty members of a good university provide a panel of experts possessing a wide range of highly developed skills available on a consulting basis to aid industry with its problems; thus even a small company near a university can have access to specialized knowledge in depth on a basis that it can afford. A university close at hand provides educational opportunities for employees, so that those with good potential but inadequate training can be upgraded, and all can be kept abreast of new scientific developments. Finally, in an intangible but very real way, a university provides an atmosphere that stimulates creativity and makes a community attractive to scientifically minded individuals.

When these factors are viewed in perspective, it is seen that education is perhaps the most significant factor affecting the future of electronics. Education is a resource of first importance to that part of the electronics industry that is growing through creative activity. Thus, the Boston area may be stagnant in many fields of industry, but it is one of the liveliest places in the country for the new electronics. This is easily traceable to the Massachusetts Institute of Technology and Harvard University. Similarly, a spectacular development of creative electronics has taken place on the San Francisco Peninsula during the last dozen years. Stanford University is at its center, and this is not an accident. The university has over 400 graduate students in electrical engineering and trains more Ph.D.s than any other school in the country.

Electronics in the Midwest lacks the explosive character of electronics on the Pacific Coast and in New England. This region does not lead in the development of new ideas and in the opening up of new fronts of activity. This is because electronics in the Midwest has for over a quarter century been more interested in the exploitation and the refinement of existing ideas and existing product lines than in opening up new fields of activity. It has been more concerned with trying to make money by redesigning established products than with attempting to grow from the exploitation of new products. It has not developed a strong component of research and as a result has spawned nothing comparable to the Bell Telephone Laboratories, David Sarnoff Laboratory, Lincoln Laboratory, or General Electric Research Laboratory. In short, the Midwest is still preoccupied with the *old* electronics.

Now why has it lagged in the *new* electronics? In searching for the answer one starts with the period before World War II. At that time the Midwest was the great center of the nation in electronic manufacturing, with emphasis on consumer items in which practical design know-how, materials cost, and efficiency in mass production were important. The technology of these products was stabilized, and they offered only limited opportunity for creative work growing out of new developments in science. As a result, formal graduate training was not required of the engineers and scientists. When the war brought microwave radar, servo-mechanisms, sonar, the first solid state devices (diodes), and computers, the electronics industry of the Midwest was unprepared. It did not include many people who were technically qualified to take a leading part in this type of work, and it did not have industrial research laboratories capable of pioneering these new developments. Neither did it have government laboratories such as the Naval Research Laboratory. It did not develop war research laboratories in electronics associated with universities, as typified by the Radiation Laboratory at MIT, the Radio Research Laboratory at Harvard, the Underwater Sound Laboratory at Harvard, and the Airborne Instruments Laboratory at Columbia.

As a result, most of the Midwest electronics industry participated only at second hand in the new electronics of World War II. Leadership came largely from the East Coast, and when the Midwest did participate it was largely in the design and production of equipment based on concepts, techniques, and laboratory models originated in the East by groups more deeply oriented in science. By and large, midwestern electronics simply did not have the scientific competence to stand on its own feet with respect to the war-developed techniques and devices. The lack of scientific depth in midwestern electronics made it difficult or impossible to use fully the region's productive capacity in getting these new devices produced.

At the end of the war electronics in the Midwest, having been only superficially inculcated with the new ideas that originated in World War II, reverted to its old interests emphasizing the engineering, design, and production of products for the consumer market. This was profitable as long as television was being introduced into new areas,

but it had limited opportunity for growth once television was established in every community. In recent years, sales of television and radio receivers have not been growing much, and the Japanese may well get an increasing share of the total in the future. In the lush days of television, too few midwestern organizations used their television profits and engineering organizations to establish a strong position in other areas of electronics with greater potential.

In contrast with the postwar course of events in the Midwest, the electronics industry of the East Coast continued its interest in the further development of the new concepts introduced into electronics during the war and strengthened research and technical staffs that were oriented toward science. As a result, the East is now strong in the new areas of electronics with almost unlimited growth possibilities.

In view of the above, one may wonder why western electronics has grown so rapidly during the last fifteen years, when it was much less important than midwestern electronics before and during the war. The answer is that after the war some strongly science oriented concerns began to develop on the West Coast. They prospered and demonstrated the possibilities of growth and profits through developing products in which a high proportion of the value was in the engineering involved, in contrast with the principal products of the Midwest where the value resided to a much greater degree in material and labor costs. Thus the West, without a tradition, got started in a new and forward looking pattern at the end of the war.

In contrast with the East and West Coasts, the electronics industry of the Midwest has not been much interested in the person with the Ph.D. and what he or she can contribute to the opening up of new frontiers. It has failed signally to exploit the educational resources and the educational institutions that are available to it. It was not willing during the past fifteen years to put much of its own money into the development of new kinds of products; in fact until recently it has not shown much interest in research and development even when the government would pay the bill. To be brutally blunt, the major path of electronics took off in a new direction in the decade 1940–1950, but little of the electronics industry of the Midwest followed. There are, of course, individual exceptions to these general statements, but in broad terms what is said here is true. The Midwest somehow has not developed much enthusiasm for staffing high concentrations of people who have the highly technical background required to do creative work in the new and rapidly growing areas of electronics. This is emphasized by the fact that there are various companies with headquarters in Chicago that do their creative work elsewhere in the country, while examples of the reverse are scarce indeed.

The basic problem of midwestern electronics is what academics call anti-intellectualism. In broad terms, the Midwest is more interested in those with practical know-how than in those whose strength is depth of training in advanced science and technology. Not enough midwestern companies know how to make effective use of the egghead type. As a result, midwestern companies do not really fight for the people with advanced degrees in electronics being produced by their own universities, let alone by universities in other parts of the country. The consequence is that the midwestern schools do not produce such people in large numbers. Stanford alone (and Stanford is not a large school) produces more people each year with advanced degrees in electronics than do all of the institutions in the state of Illinois. Put another way, California produces more people with advanced degrees in electronics each year than do the states of Illinois, Wisconsin, Indiana, Michigan, Minnesota, Missouri, and Iowa all put together. Under these circumstances it is no wonder that many of the brightest graduates from midwestern schools are recruited by West Coast colleges, complete advanced training there, and devote their subsequent careers to advancing electronics in the West. Such institutions as MIT and Harvard also transplant a group of the brightest young people from the Midwest to the East Coast.

Another facet of this anti-intellectualism is that the electronics industry in the Midwest has not adequately appreciated the educational institutions in its midst and has not made full use of them. It is surprising that there are not more electronic companies of the creative type clustered around outstanding midwestern universities. This is the result of both lack of vision on the part of industry and of lack of leadership on the part of the institutions.

These remarks are deliberately provocative. The electronics industry of the Midwest is in a rut and needs to be jolted out of it. It lacks the glamour and the growth potential that it should have. Electronics in the Midwest has a long tradition and a successful past. It can have a worthwhile future and can participate more in the good new things that are ahead in the field of electronics during the next several decades, but only by developing with the times. If it just plods along, the Midwest will become increasingly the peon group in the electronics industry, which does hard, unexciting work and makes a living, while at the same time the East Coast and particularly the West Coast electronics industries will have all of the fun and most of the growth. If the Midwest continues in the present pattern, it will continue to be the happy hunting ground where bright young people are recruited to go to the East and West Coasts to make the electronics industries there steadily stronger and ever growing.

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THE EFFECT OF RECESSION ON THE METROPOLITAN AREAS

by PAUL J. KOZLOWSKI, *Associate Director, The Management Center, and Associate Professor, College of Business Administration, University of Toledo*

The last two years have been extremely disruptive for the region's economy. The industrial heartland surrounding the Great Lakes was hit by a recession less than four years after the severe slump of 1973–1975. Given the region's heavy dependence on the production of durable goods, such as autos and steel, the hard landing is not at all surprising. This time, however, the cyclical downswing has been exacerbated by a sizable and long-lasting slump in auto sales and structural adjustments in the domestic automobile industry. Both have contributed to greater than anticipated cutbacks in production and employment.

After the setbacks experienced in the 1973–1975 recession, the recent business slump is a startling reminder of the acute sensitivity of this part of the country to slowdowns in national business activity. In 1980, the Great Lakes states of Illinois, Indiana, Michigan, Ohio, and Wisconsin posted an average unemployment rate of 9.3 percent, well above the national average of 7.1 percent. As usual, Michigan's jobless rate was the highest, hitting 12.6 percent in 1980 compared to 7.8 percent in 1979. At its previous high in 1975, the state's unemployment rate was 12.5 percent. In addition, personal income in the five-state region rose only 7.4 percent from the third quarter of 1979 to the third quarter of 1980, compared to 10.1 percent nationwide and 13.4 percent and 12 percent in the Southwest and New England, respectively. In Michigan, personal income expanded only 5 percent during that period. Two years ago, the comparable growth rate for the state was 11.8 percent. Without detailing the grim set of interregional economic statistics for the last two years, it is fairly obvious that the burdens of the slowdown and contraction in the national economy have been borne disproportionately by this region.

In Michigan, industrial activity and population are heavily concentrated in eleven Standard Metropolitan Statistical Areas (SMSAs) stretching across the southern half of the state. These SMSAs have suffered job losses and experienced rising unemployment rates over the last two years because of declines in industrial production, which have resulted in sizable layoffs in automobile plants and severe cutbacks in many related industries. As the largest SMSA in the state and one of the largest metropolitan areas in the country, Detroit has received the most attention. But the other SMSAs in Michigan have also been affected, quite severely in some cases. Previous research revealed that the state's SMSAs display wide variations in short-run business activity, associated to a great extent with differences in structural characteristics.[1] How have these areas performed during the most recent slump compared to the severe recession that hit the state in 1973–1975? Are business conditions really much worse in these SMSAs this time; if so, in what way?

This article addresses these questions by examining a set of quarterly economic indicators covering labor market, construction, and financial activity in the state's eleven SMSAs. While overall business activity in these areas conforms fairly closely to national business cycle patterns, downswings in these local economies have been considerably more severe than those of the national economy. Updating and analyzing a set of economic indicators for Michigan SMSAs contained in the regional data base at the University of Toledo reveals some differences as well as

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similarities in the timing, duration, and magnitude of the most recent slump in business activity compared to the 1973–1975 recession. These local economic indicators are listed in Tables 1, 2, and 3.

In tracking business activity in the state's SMSAs during the recent recession, turning points in twelve local series were determined and compared with national business cycle peak and trough dates specified by the National Bureau of Economic Research (NBER). That chronology provides a useful benchmark against which the timing of local peaks and troughs can be measured. The amplitude measures shown in Table 3 are absolute values of the percentage change in each specific local series from its peak to trough, or, conversely, low to high value for local unemployment rate and initial claims for unemployment insurance series. The latter move in a direction opposite to that of business activity in general.

For each of the twelve local indicators, Table 1 shows the number of SMSAs in which cyclical turning points either led, lagged, or were roughly coincident with the last two national business cycle peaks; one occurring in the fourth quarter of 1973 and another in the first quarter of 1980. Note the overwhelming preponderance of leads at the 1980 peak. This leading behavior in relation to the recent national peak is pronounced not only in local series that usually change direction prior to the onset of a recession (such as the average workweek, initial claims for unemployment insurance, deflated total deposits at commercial banks, and new building permits), but also in series of broader coverage (such as total wage and salary employment, manufacturing employment, the unemployment rate, and total loans at commercial banks). The pervasiveness of leads across the economic processes in the SMSAs at the 1980 peak differs from the timing at the 1973 peak. While the average workweek, initial claims, new building permits, and deflated total deposits did lead in most SMSAs in 1973, the leads were substantially longer, on the average, at the 1980 peak. Also, all eleven Michigan SMSAs experienced early downturns in total wage and salary employment and manufacturing employment, with the leads averaging 3.5 and 3.8 quarters, respectively, relative to the 1980 peak. In contrast, the beginning of the recessions in the SMSAs in 1973 coincided fairly closely with the national business cycle downswing, and as Table 1 shows, leads or lags in local total wage and salary and manufacturing employment were fairly short, on the average. Furthermore, note the striking difference in the timing of the cyclical downswings in total loans, consumer installment loans, and commercial and industrial loans at the two peaks. While lagging behavior dominated in 1973, leading behavior was pervasive among the SMSAs in 1980.

It should be noted that while the recent slump in business activity in Michigan SMSAs began well in advance of the national recession, the sequence of changes across local economic processes was exactly the same as during the 1973–1975 period. Early cyclical changes in the average workweek, initial claims for unemployment insurance, new building permits, and deflated total deposits preceded those in employment, unemployment, and total loans. Thus, prior to both recessions, early signals of an impending change in local business activity from expansion to contraction were noticeable in several sensitive economic indicators in the SMSAs. For the most part, the beginnings of cyclical downswings in labor market and construction activity preceded the local contractions in total loans and consumer installment loans.

Table 2 shows the number of SMSAs leading or lagging at the last two national business cycle troughs; one in the first quarter of 1975 and another estimated to have occurred in the third quarter of 1980, around July or August. Although there is a slight leading tendency on the average for most of the local labor market series at the 1980 trough compared to slight lags in the 1975 trough, there is not a considerable difference in the timing of the two recoveries in the SMSAs. With minor variations, business recoveries in Michigan SMSAs began at about the same time as national business recovery. However, there is considerable sluggishness in the local unemployment rates, as six SMSAs (Battle Creek, Grand Rapids, Jackson, Kalamazoo-Portage, Lansing–East Lansing, and Muskegon)

TABLE 1
Number of Michigan SMSAs Leading or Lagging at National Business Cycle Peaks[a]

Series	*National business cycle peak* 1973:4 Leading	Roughly coincident	Lagging	*Average lead (−) or lag (+) quarters*	*National business cycle peak* 1980:1 Leading	Roughly coincident	Lagging	*Average lead (−) or lag (+) quarters*
Average workweek of prod. workers, mfg.	10	0	0	−2.7	11	0	0	−9.2
Average weekly initial claims for unemployment insurance	9	1	1	−2.0	11	0	0	−6.2
Unemployment rate	10	0	1	−1.2	11	0	0	−5.1
Total wage and salary employment	3	6	2	+0.4	11	0	0	−3.5
Manufacturing employment	5	4	2	−0.3	11	0	0	−3.8
Nonmanufacturing employment	1	2	7	+1.7	10	1	0	−2.5
New building permits	10	1	0	−4.0	11	0	0	−7.2
Construction employment	8	1	2	−1.9	11	0	0	−3.7
Deflated total deposits	10	0	1	−1.9	11	0	0	−6.5
Total loans[b]	0	1	8	+2.2	7	3	1	−1.4
Consumer installment loans[b]	0	4	7	+1.6	10	1	0	−1.5
Commercial and industrial loans[b]	2	1	4	+0.9	5	1	0	−3.0

a. Eleven SMSAs were considered for each series. In some cases, a local turning point was not discernible so that some totals are less than eleven.
b. Measured in current dollars.

TABLE 2

Number of Michigan SMSAs Leading or Lagging at National Business Cycle Troughs[a]

Series	National business cycle trough 1975:1 Leading	Roughly coincident	Lagging	Average lead (−) or lag (+) quarters	National business cycle trough 1980:3[b] Leading	Roughly coincident	Lagging	Average lead (−) or lag (+) quarters
Average workweek of prod. workers, mfg.	3	5	2	−0.3	7	4	0	−1.1
Average weekly initial claims for unemployment insurance	1	9	1	+0.1	10	1	0	−0.9
Unemployment rate	0	5	6	+0.7	4	0	7	+0.3
Total wage and salary employment	0	5	6	+1.0	4	7	0	−0.4
Manufacturing employment	0	4	7	+1.2	4	7	0	−0.4
Nonmanufacturing employment	0	6	4	+0.4	3	4	3	−0.6
New building permits	2	5	4	−0.1	11	0	0	−2.2
Construction employment	0	0	11	+4.4	1	9	0	−0.1
Deflated total deposits	2	0	9	+2.4	5	6	0	−0.5
Total loans[c]	1	0	8	+2.3	7	4	0	−0.7
Consumer installment loans[c]	1	0	10	+1.7	4	7	0	−0.4
Commercial and industrial loans[c]	2	0	5	+1.9	2	4	0	−0.7

a. Eleven SMSAs were considered for each series. In some cases, a local turning point was not discernible so that some totals are less than eleven.
b. National and local trough dates are preliminary.
c. Measured in current dollars.

lagged behind the national recovery in 1975 and again in 1980, joined this time by the Detroit SMSA. It is important to note that this behavior is not unique to Michigan; the national jobless rate also exhibits lags at business cycle troughs. In contrast, the Ann Arbor–Ypsilanti, Bay City, Flint, and Saginaw SMSAs hit cyclical highs in their unemployment rates during spring 1980 and have declined since.

Construction and financial activities in the SMSAs seem to have recovered earlier this time compared to 1975, when some fairly long lags were observed. It appears that those sectors began to pick up fairly close to the time that the national recession ended, and so far activity seems to be advancing slowly, as the moderate but ongoing national recovery continues.

The timing summaries show that business activity in most of Michigan's SMSAs began to advance at about the time that the national economy moved from recession to recovery. This is certainly the case for the two major employment series — total wage and salary employment and manufacturing employment. But while that is a good sign, it should be remembered that, during the recent recession, employment began to fall and unemployment started to rise much earlier in Michigan SMSAs than in the nation as a whole. Overall, the timing information from Tables 1 and 2 indicates that while the national economy has just experienced one of its shortest recessions — confined primarily to the first half of 1980 — the falloff in business activity in Michigan SMSAs has lasted considerably longer. The protracted local business slumps, which are attributable to the early onset of recessionary trends in the state, represent a marked difference from 1973–1975, during which time the contraction in local business activity lasted only slightly longer than the national recession.

Was the most recent recession more severe than the 1973–1975 slump? The general impression is that it was. However, the magnitudes of the cyclical contractions in the local indicators shown in Table 3 do not solidly support such a conclusion. The average workweek did fall more during the most recent slump compared to the 1973–1975 recession in eight of the eleven SMSAs. But initial claims for unemployment insurance rose relatively more this time in only three SMSAs — Flint, Lansing–East Lansing, and Saginaw — where the manufacturing sector is heavily concentrated in auto production. In the other SMSAs, the overall rise in initial claims was large in absolute terms, but the relative increase from cyclical lows in 1978 or 1979 to highs in 1980 was smaller than during the 1973–1975 period. Similarly, the magnitude of the increase in the unemployment rate was greater in relative terms only in the Bay City (160.4 percent versus 159.1 percent) and Saginaw (213.0 percent versus 197.3 percent) SMSAs. This does not suggest, however, that joblessness in Michigan SMSAs is less serious this time; it is at least as serious. The reason for the recent relatively moderate increases in the unemployment rate is that ten of the eleven SMSAs entered the 1980 recession with a significantly higher jobless rate than existed prior to the start of the recession in 1973. The Grand Rapids SMSA is the only exception. Also, the cyclical highs in the local unemployment rates in 1980 were not considerably above those of 1975. The Flint SMSA is a good example. In summer 1973, the jobless rate in Flint hit a seasonally adjusted cyclical low of 5.3 percent then rose to a high of 18.5 percent in the first quarter of 1975. The pre-1980 recession low in Flint was 7.5 percent in the second quarter of 1978, and the cyclical high was 21.4 percent in spring 1980. Similarly, in the Detroit SMSA, the pre-1980 recession low for the unemployment rate was 6.4 percent in the second quarter of 1978, compared to 5.5 percent in the third quarter of 1973; it rose to an average of 14.2 percent in the last three months of 1980, compared to 12.7 percent in the first quarter of 1975. In contrast, the unemployment rate in the Grand Rapids SMSA rose from a relatively low level of 4.9 percent in the first quarter of 1978 to 9.6 percent in the fourth quarter of 1980, compared to a jump from

(Continued on page 7)

The MICHIGAN STATE ECONOMIC RECORD

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Michigan Economic Indicators

Item	Year previous of latest month	Previous month	Latest month
Manufacturing workers:			
Average weekly hours, Michigan	39.9	41.1	40.1 (Feb.)
Average weekly hours, U.S.	39.8	39.9	39.5 (Feb.)
Average hourly earnings, Michigan ($)	9.13	10.16	10.11 (Feb.)
Average hourly earnings, U.S. ($)	7.00	7.73	7.74 (Feb.
U.S. motor vehicle production (units)	794,331	613,274	786,623 (Mar.)
Michigan electricity usage (mil. kwh.)	6,278	6,082	6,296 (Jan.)
Industrial (mil. kwh.)	2,544	2,643	2,357 (Jan.)
Residential (mil. kwh.)	2,239	2,008	2,382 (Jan.)
Raw steel production:			
Michigan (000 net tons)	810	770	702 (Feb.)
United States (000 net tons)	10,332	10,590	10,028 (Feb.)
Consumer price index (1967 = 100)			
Detroit area	242.9	269.0	268.2 (Mar.)
United States	239.8	263.3	265.1 (Mar.)
U.S. wholesale price index (1967 = 100)	261.5	286.9	289.6 (Mar.)
Michigan farm prices received index (1967 = 100)	236	259	260 (Mar.)

SOURCES: U.S. Bureau of the Census; U.S. Bureau of Labor Statistics; Michigan Crop Reporting Service; Motor Vehicle Manufacturers Association, Inc.; American Iron and Steel Institute; and Energy Information Administration.

Contracts for Future Building, First 2 Months: 1980 and 1981

(Thousands of Dollars)

Area	Nonresidential 1979	Nonresidential 1980	Nonresidential Percentage change	Residential 1979	Residential 1980	Residential Percentage change	Total[a] 1979	Total[a] 1980	Total[a] Percentage change
Ann Arbor	11,727	6,562	− 44	5,849	7,354	+ 26	17,576	13,916	− 21
Battle Creek	1,051	2,661	+153	894	1,121	+ 25	1,945	3,782	+ 94
Bay City	215	784	+ 32	529	617	+ 17	744	1,401	+ 88
Detroit	102,529	135,243	+ 32	78,458	55,181	− 30	180,987	190,424	+ 5
Flint	13,720	9,252	− 33	4,982	6,675	+ 34	18,702	15,927	− 15
Grand Rapids	47,554	11,268	− 76	18,378	9,851	− 46	65,932	21,119	− 68
Jackson	3,963	5,233	+ 32	886	3,755	+324	4,849	8,988	+ 85
Kalamazoo-Portage	2,125	2,019	− 5	5,123	5,876	+ 15	7,248	7,895	+ 9
Lansing–East Lansing	9,759	7,516	− 23	15,247	15,695	+ 3	25,006	23,211	− 7
Muskegon–Norton Shores–Muskegon Heights	656	784	+ 20	2,652	1,772	− 33	3,308	2,556	− 23
Saginaw/Toledo	3,855	742	− 81	4,603	1,337	− 71	8,458	2,079	− 75
	21,301	13,342	− 37	16,026	19,989	+ 25	37,327	33,331	− 11
Michigan	209,474	194,044	− 7	166,937	134,752	− 19	376,411	328,796	− 13
United States	7,763,100	8,207,200	+ 6	8,420,200	8,412,200	——	16,624,600	16,178,100	+ 3

SOURCE: F. W. Dodge Division of McGraw-Hill Information Systems Company, news releases.

NOTE: Battle Creek includes Barry and Calhoun counties; Detroit includes Lapeer, Livingston, Macomb, Oakland, St. Clair, and Wayne counties; Flint includes Genesee and Shiawassee counties; Grand Rapids includes Kent and Ottawa counties; Kalamazoo-Portage includes Kalamazoo and Van Buren counties; Lansing–East Lansing includes Clinton, Eaton, Ingham, and Ionia counties; and Muskegon–Norton Shores–Muskegon Heights includes Muskegon and Oceana counties.

a. Excludes nonbuilding construction contracts. This category comprises streets and highways, bridges, dams, reservoirs, river and harbor developments, sewerage and water supply systems, missile and space flight facilities, airports, utilities, and communication systems. For Michigan the 1980 and 1981 figures for nonbuilding construction contracts were $70,900,000 and $99,235,000 respectively, or an increase of 40 percent. U. S. figures for nonbuilding construction contracts were $4,721,100 and $4,471,800 or a decrease of 6 percent.

Year-to-Year Change in Selected Economic Indicators

Percentage change from previous year

Indicator	1980 Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	1981 Jan.	Feb.	Mar.
Civilian employment													
United States	+ 1.1	+ .9	+ .5	− .1	− .3	− .1	− .3	− .2	− .1	− .5	−	+ .1	+ .8
Michigan	− 4.3	− 4.4	− 7.9	− 7.2	− 8.2	− 5.0	− 6.1	− 6.3	− 6.3	− 4.9	− 3.3	− 4.0	− 2.1
Detroit area[a]	− 5.6	− 5.9	− 9.5	− 9.0	− 9.5	− 6.1	− 7.3	− 7.0	− 6.6	− 5.6	− 4.1	− 5.0	− 2.9
Outstate[b]	− 3.1	− 2.9	− 6.4	− 5.7	− 7.0	− 4.1	− 5.1	− 5.6	− 6.1	− 4.2	− 2.6	− 3.2	− 1.4
Wage and salary jobs[c]													
United States	+ 1.9	+ 1.7	+ .9	+ .1	− .2	−	+ .1	+ .2	+ .4	+ .5	+ .5	+ .5	+ .5
Michigan	− 3.7	− 5.3	− 7.4	− 7.5	− 8.2	− 6.1	− 5.8	− 4.3	− 3.0	− 3.3	− 1.8	− 2.2	− 1.4
Detroit area[a]	− 5.1	− 6.8	− 8.8	− 8.4	− 8.5	− 5.9	− 5.5	− 4.5	− 3.2	− 4.0	− 3.1	− 3.1	− 2.2
Outstate[b]	− 2.3	− 3.9	− 6.1	− 6.6	− 7.9	− 6.2	− 6.0	− 4.1	− 2.7	− 2.7	− .6	− 1.4	− .7
Average workweek[d]													
United States	− 2.0	+ 1.3	− 2.0	− 2.5	− 2.8	− 1.8	− 1.2	− 1.2	− .2	− .2	+ .3	− .8	+ .5
Michigan	− 6.5	+ 6.4	− 6.4	− 5.5	− 3.6	− 2.2	− 1.2	−	+ 4.3	+ 1.0	+ 2.5	+ .5	
Average weekly earnings[e]													
United States	+ 5.5	+ 9.6	+ 5.4	+ 5.3	+ 5.5	+ 7.0	+ 7.8	+ 8.3	+10.2	+10.1	+11.3	+ 9.7	+ 10.7
Michigan	+ .3	+14.6	− 2.2	+ 1.5	+ 3.4	+ 6.6	+ 8.9	+11.7	+17.5	+13.8	+14.9	+ 11.3	
Motor vehicle assembly													
United States	−36.6	−28.5	−50.2	−43.7	−48.2	−32.4	−17.6	−16.7	−13.4	+ .9	−13.4	− 23.2	− 7.4
Michigan	−49.7	−40.6	−62.1	−50.9	−54.4	−35.8	−20.1	−16.2	−19.7	+15.0	− 8.7	− 17.9	+ 21.5
General Motors	−45.0	−36.0	−60.9	−49.3	−44.9	−36.9	−22.7	− 9.2	−29.5	+ 8.3	−12.7	− 35.8	+ 12.2
Ford	−47.2	−46.7	−54.1	−34.7	−69.0	−31.3	−15.7	−18.0	− 1.5	+42.8	− 4.9	+ 12.3	+ 10.1
Chrysler	−74.0	−54.9	−77.1	−73.7	−86.2	−48.5	−16.5	+34.5	+ 5.2	+11.2	+23.8	+137.5	+143.3
Steel tonnage poured													
United States	− 9.0	−12.6	−27.9	−38.7	−42.5	−37.9	−26.3	−12.7	+ .6	+ 1.8	− 1.0	− 2.9	+ 2.9
Michigan	−20.7	−18.7	−42.9	−62.7	−54.8	−52.0	−33.4	−10.4	+ .8	− 6.0	− 8.3	− 13.3	−
Commercial electricity consumption													
United States	− 2.1	− .7	+ 1.7	+ 1.4	− .8	+ 1.1	+ 6.4	+ 7.9	+ 8.3	+ 2.4	+ 6.4		
Michigan	− 2.7	+ .7	+ .2	+ 3.9	− 2.8	− 4.4	+ 2.0	+ 4.6	+ 5.2	+ .1	+ 4.8		
Industrial electricity consumption													
United States	− 1.0	+ 1.1	− 1.0	− 2.8	− 6.4	− 7.2	− 7.7	− 6.4	− 2.0	+ 1.8	− .7		
Michigan	−16.0	−10.1	−14.7	−10.3	−26.1	−28.2	−19.8	−13.3	− 9.8	+ 4.8	− 7.4		
Nonresidential construction contracts													
United States	+ 3	− 5	− 7	+ 6	+ 6	− 2	− 1	+ 6	+34	+37	− 4	+ 17	+ 32
Michigan	−24	+ 1	+15	+ 8	+31	−38	−41	+10	+100	+13	−35	+ 39	− 25
Residential construction contracts													
United States	−34	−39	−44	−30	−11	−17	− 2	− 3	+24	+33	+ 4	− 4	+ 34
Michigan	−37	−69	−55	−55	−37	−38	−22	+ 5	+ 8	+17	−28	− 12	− 11
Nonbuilding construction contracts													
United States	−36	−50	−33	−24	−41	+76	+ 3	−13	−26	−18	−18	− 9	+ 7
Michigan	+28	−51	−41	−24	−29	− 8	+35	−11	+53	+13	+52	+ 34	− 33
Retail sales													
United States	+ 4.0	+ 5.4	+ 4.8	+ 2.3	+ 9.5	+ 3.8	+ 5.6	+ 8.6	+ 4.9	+ 8.9	+ 9.6	+ 5.2	
Michigan	− 3.2	− 1.3	− 3.6	− 5.5	− 6.2	− 2.0	+ 1.3	+ 3.7	− .7	+ 3.9	+ 4.8	+ 3.5	
Detroit area[a]	− 1.5	+ .5	− 3.5	− 3.5	+ 9.0	+ 1.6	+ 6.3	+10.3	− 5.4	+ 7.4	+ 8.4	+ 5.6	
Detroit city	+ 4.5	0	− 5.5	−10.2	− 4.5	− 9.2	− 3.0	+ .7	−13.2	− 6.5	− 1.6	+ 5.0	
Suburbs	− 2.7	+ .5	− 3.1	− 2.2	+11.9	+ 3.8	+ 8.1	+12.2	− 3.9	+10.0	+10.6	+ 5.7	
Outstate[b]	− 5.4	− 3.4	− 3.8	− 8.0	+ 3.0	− 6.0	− 4.3	− 3.6	+ 5.0	− .5	− .3	+ .9	
Consumer price index													
United States	+14.7	+14.7	+14.4	+14.3	+13.2	+12.8	+12.7	+12.6	+12.6	+12.4	+11.7	+ 11.4	+ 10.6
Detroit[a]	+14.8	+16.4	+16.1	+19.2	+15.6	+14.8	+16.0	+16.3	+15.2	+15.7	+13.2	+ 11.9	+ 10.3

SOURCE: Michigan Employment Security Commission, special release; Bureau of Labor Statistics, *The Employment Situation* (monthly); Motor Vehicle Manufacturers Association, special release; American Iron and Steel Institute, special release; Energy Information Administration, special release; F. W. Dodge Division of McGraw-Hill Information Systems Company, news releases (monthly); and Bureau of the Census, *Monthly Retail Trade*.

a. Wayne, Oakland, Macomb, Livingston, Lapeer, and St. Clair counties.
b. Michigan minus Detroit area.
c. The number of wage and salary jobs, except agricultural, reported by employers.
d. Average hours worked by manufacturing production workers.
e. Average earnings among manufacturing production workers.

Quarterly Personal Income in Michigan

Item	Millions of dollars, annual rates, seasonally adjusted							Percentage change 1980(3) to 1980(4)	
	1979			1980					
	2	3	4	1	2	3	4	Michigan	United States
TOTAL LABOR AND PROPRIETORS' INCOME BY PLACE OF WORK									
By type									
Wage and salary disbursements	57,715	57,370	56,989	58,599	55,675	56,942	61,006	+ 7.1	+ 4.1
Other labor income	7,726	7,691	7,644	7,994	7,655	8,001	8,680	+ 8.5	+ 3.2
Proprietors' income	4,033	4,163	4,258	4,042	3,755	3,911	4,054	+ 3.7	+ 3.5
Farm	656	646	666	415	397	384	395	+ 2.8	+ 2.0
Nonfarm	3,377	3,517	3,592	3,628	3,358	3,527	3,659	+ 3.7	+ 3.7
By industry									
Farm	839	831	852	610	596	587	598	+ 1.9	+ 1.5
Nonfarm	68,636	68,392	68,039	70,025	66,489	68,267	73,142	+ 7.1	+ 4.0
Private	59,594	59,154	58,653	60,461	56,758	58,452	63,167	+ 8.1	+ 4.2
Ag. Serv., For., Fish., and other	155	159	161	161	163	162	162	—	− .2
Mining	357	357	368	383	368	322	393	+22.0	+ 8.6
Construction	3,323	3,406	3,383	3,440	2,827	2,733	2,979	+ 9.0	+ 5.7
Manufacturing	30,087	28,869	27,988	29,069	26,329	27,485	31,049	+13.0	+ 5.1
Nondurable goods	4,443	4,390	4,475	4,426	4,310	4,418	4,648	+ 5.2	+ 3.4
Durable goods	25,644	24,479	23,514	24,643	22,019	23,067	26,401	+10.1	+ 6.1
Transportation and public utilities	3,805	3,839	3,920	3,873	3,885	3,903	4,081	+ 4.6	+ 4.0
Wholesale trade	3,590	3,676	3,679	3,743	3,646	3,665	3,781	+ 3.2	+ 3.6
Retail trade	6,051	6,112	6,210	6,326	6,068	6,266	6,416	+ 2.4	+ 2.6
Finance, insurance, and real estate	2,628	2,757	2,742	2,902	2,890	3,008	3,112	+ 3.5	+ 3.6
Services	9,598	9,979	10,202	10,564	10,585	10,907	11,194	+ 2.6	+ 3.2
Government and government enterprises	9,042	9,238	9,386	9,564	9,730	9,815	9,975	+ 1.6	+ 3.4
Federal, civilian	1,075	1,068	1,088	1,096	1,104	1,144	1,200	+ 4.9	+ 5.0
Federal, military	196	195	203	198	200	201	222	+10.4	+12.17
State and local	7,771	7,975	8,094	8,270	8,426	8,469	8,553	+ 1.0	+ 1.7
DERIVATION OF PERSONAL INCOME BY PLACE OF RESIDENCE									
Total labor and proprietors' income by place of work	69,475	69,224	68,891	70,635	67,085	68,854	73,740	+ 7.0	+ 3.9
Less Personal contributions for social insurance by place of work	3,530	3,501	3,461	3,651	3,428	3,514	3,770	+ 7.3	+ 3.5
Net labor and proprietors' income by place of work	65,945	65,723	65,424	66,984	63,657	65,340	69,970	+ 7.1	+ 4.0
Plus: Residence adjustment	431	440	452	457	457	460	480	+ 4.3	− 4.7
Net labor and proprietors' income by place of residence	66,376	66,163	65,876	67,441	64,114	65,800	70,450	+ 7.0	+ 4.0
Plus: Dividends, interest, and rent	9,816	10,081	10,537	11,104	11,627	11,927	12,210	+ 2.8	+ 2.7
Plus: Transfer payments	9,622	10,518	10,920	11,318	12,070	13,041	12,804	− 1.8	+10.6
State U.I. benefits	465	736	953	1,030	1,631	1,543	1,128	−26.9	− 7.6
Transfers excluding state U.I.	9,157	9,782	9,967	10,288	10,438	11,498	11,676	+ 1.5	+ 1.6
Personal income by place of residence	85,814	86,762	87,333	89,863	87,810	90,769	95,463	+ 5.2	+ 3.4

SOURCE: Bureau of Economic Analysis, Regional Economics Information System.

THE EFFECT OF RECESSION ON THE METROPOLITAN AREAS

(Continued from page 3)

5 percent to 12.3 percent from the third quarter of 1973 to the second quarter of 1975. With the exception of the Grand Rapids SMSA, therefore, business expansions in the SMSAs have failed to pull the local unemployment rates below previous prerecession lows. The result is a longer term upward drift in the jobless rates in most Michigan SMSAs.

During the recent recession, the steepest declines in employment occurred in the Flint and Saginaw SMSAs, where manufacturing employment dropped 25.8 percent and 28.1 percent, respectively. Due to the size of the manufacturing sectors in those two SMSAs, total wage and salary employment fell a hefty 12.1 percent in the former and 11.3 percent in the latter. Interestingly, the employment declines in the Flint SMSA were slightly less this time than during the 1973–1975 period, but those in the Saginaw SMSA were somewhat more severe. In addition to Saginaw, four other SMSAs (Battle Creek, Bay City, Detroit, and Muskegon) experienced more severe declines in manufacturing employment in the recent slump compared to the 1973–1975 recession. The Grand Rapids SMSA was the least affected of the group, with manufacturing employment falling only 8.8 percent. The Kalamazoo-Portage SMSA ranked second; manufacturing employment dropped 13 percent, which is about the same as the setback registered during the 1973–1975 recession in that area. Note that, overall, only five SMSAs (Bay City, Detroit, Jackson, Muskegon, and Saginaw) displayed greater declines in total wage and salary employment this time than during 1973–1975. In the Jackson SMSA, the larger decline in total wage and salary employment appears to be attributable to a substantially larger drop in nonmanufacturing employment than that which occurred during the 1973–1975 slump.

Of the eleven SMSAs, Grand Rapids and Kalamazoo-Portage, located in western Michigan, stand out as the local economies with the lowest degree of sensitivity to national recessions in terms of labor market activity. This is not surprising, since both areas are considerably less dependent on the auto industry than SMSAs located in eastern Michigan.

The Bay City and Jackson SMSAs suffered the most severe setbacks in new building permits (92.1 percent and 87.2 percent) and construction employment (32.3 percent and 41.6 percent) during the most recent slump. In both areas, the declines exceeded those registered during the 1973–1975 recession. Except for the Muskegon SMSA, where construction employment fell 30.6 percent this time compared to 17.4 percent during the 1973–1975 period, the recent declines in local building activity seem to be somewhat more moderate than the sizable setbacks that occurred in the mid-1970s.

TABLE 3

Amplitude of Contractions in Specific Series Conforming to the 1980 and 1973–1975 National Recessions[a]

Series	*Ann Arbor-Ypsilanti*	*Battle Creek*	*Bay City*	*Detroit*	*Flint*	*Grand Rapids*	*Jackson*	*Kalamazoo-Portage*	*Lansing-E. Lansing*	*Muskegon-Norton Shrs.-Muskegon Heights*	*Saginaw*
Average workweek of prod. workers, mfg.	17.7 (13.8)	5.5 (6.0)	19.6 [b]	9.2 (12.3)	16.0 (14.2)	6.1 (5.3)	8.7 (7.8)	5.5 (6.8)	18.4 (14.8)	(72.7) 30.6	16.4 (13.1)
Average weekly initial-claims for unemployment insurance	494.4 (639.0)	176.0 (403.7)	234.9 (269.4)	266.6 (366.6)	545.0 (522.7)	258.5 (451.8)	255.3 (283.1)	175.0 (275.5)	484.6 (218.4)	(17.4) 21.6	803.9 (471.1)
Unemployment rate	89.1 (235.4)	104.8 (153.8)	160.4 (151.9)	121.3 (149.4)	189.2 (249.1)	97.5 (146.5)	135.3 (217.2)	94.5 (168.9)	102.0 (208.1)	(11.6) 4.2	213.0 (197.3)
Total wage and salary employment	5.1 (7.7)	6.0 (6.2)	8.3 (6.3)	8.5 (8.1)	12.1 (13.7)	2.2 (5.2)	9.4 (7.9)	3.3 (3.3)	2.9 (2.9)	[b] 16.0	11.3 (7.6)
Manufacturing employment	15.4 (26.6)	17.8 (2.2)	22.2 (20.2)	23.3 (20.1)	25.8 (26.0)	8.8 (18.1)	21.4 (26.5)	13.0 (13.6)	21.9 (24.2)	(6.3) 24.1	28.1 (20.9)
Nonmanufacturing employment	2.0 (4.8)	(16.0) 2.2	3.5 (1.6)	2.5 (3.6)	2.6 (5.3)	[b] (1.1)	7.2 (4.2)	2.3 [b]	0.9 (2.1)	[b] 7.9	3.4 (3.2)
New building permits	50.0 (88.6)	50.6 (84.5)	92.1 (72.3)	45.2 (67.5)	58.4 (79.6)	35.4 (46.3)	87.2 (33.9)	60.9 (75.3)	38.2 (71.2)	(7.5) 127.6	65.7 (73.7)
Construction employment	21.2 (43.6)	11.0 (35.0)	32.3 (30.8)	20.3 (23.1)	[b] (53.2)	15.4 (19.8)	41.6 (30.0)	10.6 (13.6)	11.2 (22.6)	(220.3) 104.3	32.1 (40.5)
Deflated total deposits	14.8 (8.9)	19.6 (16.5)	15.5 (17.8)	19.9 (11.2)	17.8 (14.0)	15.0 (9.1)	21.5 (11.1)	12.7 (14.6)	25.6 (16.1)	(146.0) 7.1	12.3 (6.8)
Total loans[c]	3.0 [b]	8.9 (9.8)	2.1 (4.1)	1.3 (6.5)	3.3 (3.1)	2.8 (4.8)	10.0 (6.4)	5.0 (4.1)	7.0 (4.4)	(4.1) 23.2	2.0 (2.8)
Consumer installment loans[c,d]	22.1 (4.3)	17.7 (32.5)	9.4 (9.0)	13.5 (9.8)	15.5 (6.0)	15.7 (8.7)	13.6 (14.4)	11.8 [b]	12.2 (8.4)	(16.0) 1.7	11.1 (6.2)
Commercial and industrial loans[c,d]	[b] [b]	15.0 (26.1)	12.9 (21.4)	[b] (7.3)	[b] (6.3)	[b] (5.6)	22.9 (18.3)	9.3 [b]	15.0 [b]	(1.6) 40.1	[b] (12.2)

a. Amplitude measures represent absolute values of percentage changes from peak to trough for specific phases conforming to the national recessions. Numbers in parentheses are the measures for the 1973–1975 recession.
b. Contraction phase not evident.
c. Measured in current dollars.
d. Measures based on seasonally unadjusted data.

The amplitude measures for the four local financial series show that the falloff in total deposits and total loans in the SMSAs during the recent recession was at least as severe as that of the 1973–1975 period. The most precipitous declines in the deflated value of total deposits at commercial banks occurred in the Lansing–East Lansing SMSA (25.6 percent), followed by Muskegon (21.6 percent), Jackson (21.5 percent), Detroit (19.9 percent), and Battle Creek (19.6 percent). Compared to the 1973–1975 recession, the falloff in deflated total deposits was considerably greater this time in Jackson (11.1 percent versus 21.5 percent), Muskegon (11.6 percent versus 21.6 percent), and Saginaw (6.8 percent versus 12.3 percent). Only in the Bay City and Kalamazoo-Portage SMSAs were the downswings in deflated total deposits less than during the 1973–1975 recession.

With regard to total loans in the SMSAs, Detroit exhibited a relatively moderate drop of 1.3 percent in current dollar terms during the recent slump compared to a 6.5 percent drop in the 1973–1975 period. That is the best performance among the eleven SMSAs. In contrast, the Jackson area experienced a much more severe decline in total loans in the recent period, 10 percent compared to 6.4 percent in 1973–1975. In the Ann Arbor–Ypsilanti and Muskegon SMSAs, where the current dollar value of total loans did not fall during 1973–1975, total loans slipped 3.0 percent and 4.2 percent, respectively, during the recent recession.

The magnitudes of the declines in consumer installment loans indicate why the recent downswings in total loans in most of the SMSAs were either close to or somewhat greater than those of the 1973–1975 period. In nine of eleven SMSAs, consumer installment loans dropped more in the recent recession than during the 1973–1975 slump. In the Ann Arbor–Ypsilanti SMSA there is a considerable difference, a 22.1 percent fall this time compared to a modest drop of 4.3 percent during the mid-1970s. Also, notice that consumer installment loans did not decline at all during the 1973–1975 recession in the Kalamazoo-Portage SMSA but fell off 11.8 percent during the most recent slump. Furthermore, it is interesting to note that while the Battle Creek SMSA suffered the second most severe contraction in consumer installment loans among the SMSAs during the recent slump, the 17.7 percent decline in that area was substantially less than the 32.5 percent drop recorded during the 1973–1975 period.

Finally, the behavior of commercial and industrial loans is mixed. Five SMSAs (Ann Arbor–Ypsilanti, Detroit, Flint, Grand Rapids, and Saginaw) did not display absolute declines that could be classified as conforming to the recent recession. However, in the Jackson, Kalamazoo-Portage, Lansing–East Lansing, and Muskegon SMSAs, the contractions in commercial and industrial loans were certainly more severe compared to the experience in 1973–1975.

The timing and amplitude measures presented in the tables for the 1973–1975 and 1980 recessions lead to several conclusions about business activity in Michigan SMSAs during the two periods. In both, the slumps in the local metropolitan economies were widely diffused across labor market, construction, and financial activities. But in the recent recession, the slump in business activity in the Michigan SMSAs began well in advance of the national recession that started in early 1980. Clear signs of a cyclical decline were evident in the average workweek, initial claims for unemployment insurance, new building permits, and deflated total deposits in all Michigan SMSAs in 1979 and in some cases 1978. Although there is considerable variation in the trough dates for labor market, construction, and financial indicators across the SMSAs, the local economies in the state began to recover at about the time the previous national recession ended. Therefore, the overall duration of the recent slump in business activity has been considerably longer in Michigan SMSAs compared to the nation as a whole. The severity of the recent recession in the SMSAs appears to be very close to, and in some cases somewhat worse than (deposits and loans, for example), the severe business slump that hit the state in 1973. However, while the most recent recession seems to be very close in order of magnitude to that of 1973–1975, its distinguishing characteristic is duration. It has simply lasted a good deal longer than the previous slump, and the recovery so far has been weak, with little to suggest that a robust regional business expansion is about to start. Consequently, many of Michigan's SMSAs appear to be in the midst of a protracted period of depressed economic activity.

Note

1. Paul J. Kozlowski, *Business Conditions in Michigan Metropolitan Areas* (Kalamazoo: Upjohn Institute for Employment Research, 1979).

BRIEF

For the construction industry as a whole, 1981 promises to be another very lean year. Interest rates for home mortgages will remain above 12 percent. The supply of mortgage money at savings and loan associations is being affected by deregulation of the nation's financial institutions. With deregulation, the S&Ls lose their advantage of offering higher returns to small depositors than do commercial banks. However, they will be able to compete with banks for NOW accounts. On balance the outcome is not clear. It is likely that the residential market will be depressed by the money situation until mid-year, when a modest recovery will begin.

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CITIZEN SOLDIERS

by DAVID I. VERWAY, *Research Professor, Division of Research, Graduate School of Business Administration, Michigan State University*

Troop strength of the Michigan Army National Guard totaled 10,451 at the end of 1980. These men and women train in fifty-one regional armories, at Camp Grayling, Custer Reserve Forces Training Site, or elsewhere. For example, Company F (Ranger), 425th Infantry of Pontiac, might be sent into a Puerto Rican jungle for a weekend of reconnaisance practice. In addition to forty-eight weekend training assemblies each year, of at least four consecutive hours each, units must complete a minimum of fifteen consecutive days training annually. Most Michigan guard units participate in exercises conducted each summer at Camp Grayling, although some may train at other guard bases or at army bases in this country or overseas. The Michigan Army National Guard belongs to the 46th Infantry Brigade (3,226 people, headquarters Wyoming), the 46th Engineer Group (1,871, Flint), the 177th Military Police Group (1,227, Detroit), the 72d Support Brigade (3,491, Lansing), the Michigan Army National Guard Headquarters (291, Lansing), and the Michigan Army National Guard Training Site (345, Grayling).

The Michigan Air National Guard was 2,300 strong at the end of 1980. The 110th Tactical Air Support Group at Battle Creek had 691 men and women, the 191st Fighter Interceptor Group at Mt. Clemens had 793, and the 127th Tactical Fighter Wing at Mt. Clemens had 738. There were 27 men and women at the headquarters of the Michigan Air National Guard in Lansing, 37 at the Air National Guard Site Detachment in Alpena, and 14 at the Michigan Air National Guard Headquarters Detachment in Mt. Clemens.

Except when mobilized by the president, the governor is the commander in chief. The overriding mission of the guard is training for combat readiness. The governor has mobilized the guard to provide various kinds of assistance, as during the tornado disasters in Flint and Port Huron in 1953 or to maintain law and order and protect lives and property during the Detroit riots of 1967. Governor Stevens T. Mason (of Michigan Territory) sent the guard to the "Toledo War" in September 1835.

Potential annual income for the new private amounts to $1,052.73, that for a seasoned sergeant, $3,822.84. Guard officers can earn from $1,941.00 to $5,769.54 on weekend and annual training.

FACILITIES OF THE GUARD

Rasmus Hanson, a lumber baron, donated 18,000 acres of land to the State of Michigan in 1913 to be used for guard training. Previously, training took place at various sites in and outside Michigan. Customarily, cities vied for the privilege. For example, the annual encampment was held at Camp Duffield, outside Ludington, in 1912 and in Port Huron in 1911. It seems worth mentioning that the field inspection of the Port Huron camp was conducted by Captain Douglas MacArthur on behalf of the U. S. Army.

Camp Grayling now encompasses 121,000 acres. The main camp, on Lake Margrethe, has headquarters buildings, mess halls, barracks, a dispensary, storage facilities, and so forth. Most infantry training is con-

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ducted at the 45,000 acre South Camp, which has mortar and small arms ranges and an excellent terrain for that purpose. Tank, helicopter, artillery, and Air National Guard air to ground ranges are located in the 75,000 acre North Camp, considered to be one of the finest such training sites in the country because of its vast, unimpeded ranges. Camp Grayling Military Reservation is operated by a permanent party of military personnel and civilians. During 1980, units of the Michigan, Ohio, Indiana, Wisconsin, and Louisiana guard trained there. Canadian militia, U. S. Naval Reserve, and Air Force (Reserve) Rescue units also used the facilities.

Grayling Army Airfield is located off the reservation near the city of Grayling. The Mobilization and Training Equipment Site (MATES) is a separate part of the airfield. MATES, operated by the Michigan guard with the assistance of sixty-nine federal technicians and three night watchmen, maintains equipment belonging to the Michigan, Ohio, and Indiana Army Guard. Because the U. S. military establishment is short of armored carriers and trucks, this pooling of equipment is essential for exercises of batallion scale. Michigan's armored units (Dowagiac, St. Joseph, Manistee, Cadillac, and Three Rivers) could not train as a batallion without Ohio and Indiana equipment to complement their own. Without that concentration, Ohio and Indiana would not send their guard units here for annual training. They would go to Fort Knox, Kentucky, or elsewhere. (Ohio has no sizable guard camp. Camp Atterbury in Indiana is inadequate for batallion-scale artillery and armored exercises such as those that can be accommodated at Camp Grayling.)

Phelps Collins in Alpena is to the Air National Guard what Camp Grayling is to the Army National Guard. Thirty-six federal and twenty-nine Michigan civil service employees operate this site. Guard units from Michigan and other states use it, as do personnel from the U. S. Air Force, Air Force Reserve, Marine Corps Reserve, and Navy Reserve.

Custer Reserve Forces Training Site, near Battle Creek, also operated by the Michigan guard, is an ideal facility for weekend training for nearby Michigan and Indiana guard. The Michigan Military Academy, housed there, is the principal source of Michigan guard second lieutenants.

Selfridge Air National Guard Base is operated by fourteen Michigan officers supported by all five branches of the U. S. military establishment and their reserves. More than 2,700 full-time government civilian and military personnel work there.

Other facilities in the state include the Battle Creek Air National Guard Base, the Grand Ledge Army Aviation Support Facility (helicopters), the Lansing Combined Support Maintenance Shop, and the Lansing United States Property and Fiscal Office. Armories range in size from the Detroit Artillery Armory, 493,712 square feet, to the Three Rivers Armory, 8,908 square feet. The typical armory has two federal employees, who manage and maintain equipment, and a custodian paid by the state.

FINANCING

The Michigan Air National Guard is totally federally funded. During the 1980 fiscal year, Washington sent more than $37 million for the support of Michigan's Air National Guard and three airbases.

The state bears part of the cost of funding the Army National Guard by providing civil servants as support personnel; by supplying heat, light, and utilities at armories and several other facilities; and by participating in the funding of new armories. Except when mobilized by the state, the costs of military pay and allowances are borne by the federal government. During 1980, the Michigan Army National Guard spent more than $30 million in federal and $12 million in state funds. Of this latter, $3.9 million was reimbursed by the federal government, and $900,000 was recovered in armory rental revenue. In other words, during 1980, it cost in excess of $80 million to maintain Michigan Army and Air National Guard units, of which the state contributed $7.7 million from the general fund.

RESULTS OF A SURVEY

During summer 1980, the Grayling Area Chamber of Commerce queried local uniformed military personnel. The survey was not a random sample in the statistical sense, but a catch-as-catch-can poll of people in unrestricted areas both on and off the base. Involved were 196 people from the Indiana encampment, 165 from Ohio, 273 from Michigan, and 43 others. Thirty-five were female.

Most of those surveyed (591) did not bring their families; most (582) did not go home during the middle week of their two-week stay; most (570) lived at the camp; and most (565) did not do their own cooking.

To the question "Do you shop the local stores?" 495 responded yes. Variety, gift, and party stores were the most popular. About 500 also patronized local restaurants, and 430 went to local taverns.

Only 50 respondents found the local inhabitants unfriendly or discourteous. Transportation was considered inadequate by 224. More than 400 have or would like to come to the Grayling area at times other than during training periods.

The survey revealed that guard personnel spent an average of $200 during a two-week encampment at the base. Since about 20,000 people trained at Camp Grayling last summer, it is estimated that $4 million in outside money was poured into the local economy as a result.

Full-time military and civilian government payrolls amounted to $3.2 million in 1980. Assuming that about one-third of that income was spent locally, the base was responsible for total consumer expenditures in the Grayling area of approximately $5 million. It is estimated that these dollars created 150 summer jobs, or about 6 percent of employment in the private sector of Grayling's nonmanufacturing economy last summer.

Merchants recognize the value of the base, according to a companion survey. Almost all (156 out of 159 surveyed) stated that Camp Grayling is a local asset, and nearly all (146) reported serving guard customers. Business increased for 109 respondents during guard training. Only three merchants reported no increase. (Forty-seven had no comment.)

Finally, among tourists queried in last summer's survey, 14 percent (22 out of 152) stated that their first visit to the area was related to guard training.

CONCLUDING REMARKS

The guard is not only a reserve force available at no fixed cost to the state, but also important to the nation's defense. Nationally, there are about 400,000 Army and Air National Guard. In comparison, there are about 2.2 million military personnel on full-time active duty in the U. S. armed forces. Some guard units, it is claimed, are better prepared for hostilities than are many active duty units, and at a fraction of the cost.

The Chamber of Commerce study demonstrates that Camp Grayling is an economic asset to the state, particularly to the city of Grayling. Success in marketing the base to units in other states depends more than anything else on its being well equipped. Michigan's congressmen and senators can be instrumental in this effort by attuning themselves to the situation and to the political intricacies of meeting the need for equipment, structures, and other improvements. Grayling is a bargain in comparison with the cost of maintaining a standing army.

The study also reveals that the Grayling area is lacking in transportation. It is a thinly populated summer resort designed to appeal to canoers, fishermen, and hikers, in short, outdoor enthusiasts who drive there and camp or stay in motels. Perhaps the local dial-a-ride is poorly advertised, or the guard should provide a scheduled shuttle.

There is evidence of some dissatisfaction with the leisure activities available. A survey on this matter alone probably should be undertaken. It might be worth resurrecting Bear Mountain, an amusement park that flourished during the 1960s. The park would enhance the attraction of the area to tourists as well as to the guard.

TABLE 1
The Results of a Guard Survey in the Grayling Area: Summer 1980

Item	*Michigan*	*Indiana*	*Ohio*	*Total*
Number responding	273	196	165	677
Did you attend the annual Camp Grayling training during 1979?				
Yes	208	118	107	438
No	65	76	58	237
What means of transportation did you use to come this year?				
Private	173	83	81	342
Military	90	111	81	312
Public	0	0	0	0
Other	10	2	3	23
Did you bring your family with you?				
Yes	30	24	31	85
No	243	171	134	591
Number in family–				
Responded to this question	29	24	31	84
Average no. in families of those responding	2	2	3	2
Average length of stay of families of those responding	13	12	13	13
Laundry facilities–				
Camp	71	10	27	122
Don't know yet	0	15	2	18
None	52	54	15	126
Own	4	1	6	12
Town	132	67	109	318
Do you go home during the middle weekend of annual training?				
Yes	52	13	14	80
No	210	180	151	582
What accommodations are you using?				
Camp	227	174	129	570
Parks	23	12	22	57
Rental	16	9	14	42
Do you do your own cooking?				
Yes	44	31	30	108
No	229	164	134	565
Do you patronize our restaurants?				
Yes	203	142	132	504
No	70	53	33	172
Do you shop the local stores?				
Yes	215	126	133	495
No	58	70	32	182
If yes, what type of stores?				
Drug store	24	14	6	44
Clothing store	20	11	16	51
Gift store	41	25	58	130
All kinds	49	31	33	115
Variety store	104	43	67	227
Party store	64	15	19	102
Sports store	25	7	9	42
If no, why not?				
No need	30	17	21	83
Too expensive	9	18	7	36
No time	6	3	2	11
Other	7	5	2	15
Do you patronize the local taverns?				
Yes	199	104	105	430
No	74	91	60	246
What kind of music do you prefer?				
Rock	128	53	64	253
Country western	63	50	56	18.
Disco	8	7	11	31
Other	12	16	10	43
All	58	32	18	114
Do you use dial-a-ride?				
Yes	11	21	5	50
No	262	175	160	627
Do you attend a church while here?				
Yes	56	26	19	109
No	217	170	146	568
Do you patronize the local theater?				
Yes	78	66	53	218
No	195	130	112	459
Do you use the parks?				
Yes	67	69	56	218
No	206	127	109	467
Do you use the library?				
Yes	17	9	7	44
No	256	187	158	633
Do you use the canoe facilities?				
Yes	105	79	69	269
No	168	117	96	408
Are you active in any sports while here?				
Yes	176	92	91	379
No	97	104	74	298
If so, which ones?				
Post facilities	121	71	60	267
Fish	47	13	22	87
Canoe	15	2	3	28
Swim	36	6	38	74
Other	16	10	3	31
Golf	10	6	0	17

(Continued on page 6)

The MICHIGAN STATE ECONOMIC RECORD

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Michigan Economic Indicators

Item	Year previous of latest month	Previous month	Latest month
Manufacturing workers:			
Average weekly hours, Michigan	40.2	39.1	41.0 (Mar.)
Average weekly hours, U.S.	39.8	39.5	39.9 (Mar.)
Average hourly earnings, Michigan ($)	9.34	10.11	10.23 (Mar.)
Average hourly earnings, U.S. ($)	7.06	7.74	7.79 (Mar.)
U.S. motor vehicle production (units)	638,815	807,352	804,031 (Mar.)
Michigan electricity usage (mil. kwh.)	5,886	6,296	5,718 (Feb.)
Industrial (mil. kwh.)	2,693	2,357	2,624 (Feb.)
Residential (mil. kwh.)	1,847	2,382	1,786 (Feb.)
Raw steel production:			
Michigan (000 net tons)	828	702	827 (Mar.)
United States (000 net tons)	11,439	10,028	11,774 (Mar.)
Consumer price index (1967 = 100)			
Detroit area	248.2	268.2	272.4 (Apr.)
United States	242.5	265.1	266.8 (Apr.)
U.S. wholesale price index (1967 = 100)	263.7	292.8	293.4 (May)
Michigan farm prices received index (1967 = 100)	226	260	264 (Apr.)

SOURCES: U.S. Bureau of the Census; U.S. Bureau of Labor Statistics; Michigan Crop Reporting Service; Motor Vehicle Manufacturers Association, Inc.; American Iron and Steel Institute; and Energy Information Administration.

Contracts for Future Building, First 3 Months: 1980 and 1981

(Thousands of Dollars)

Area	Nonresidential			Residential			Total[a]		
	1980	1981	Percentage change	1980	1981	Percentage change	1980	1981	Percentage change
Ann Arbor	38,179	11,747	− 69	5,558	10,960	+ 97	43,737	22,707	− 48
Battle Creek	2,236	4,334	+ 94	1,742	2,480	+ 42	3,978	6,814	+ 71
Bay City	826	1,843	+123	5,489	1,165	− 79	6,315	3,008	− 52
Detroit	169,528	200,965	+ 19	137,838	90,517	− 34	307,366	291,482	− 5
Flint	23,022	12,684	− 45	6,632	8,759	+ 32	29,654	21,443	− 28
Grand Rapids	61,494	20,110	− 67	28,857	20,823	− 28	90,351	40,933	− 55
Jackson	4,665	7,483	+ 60	2,188	4,834	+121	6,853	12,317	+ 80
Kalamazoo-Portage	6,967	9,883	+ 42	9,266	10,395	+ 26	15,233	20,278	+ 33
Lansing–East Lansing	27,027	10,277	− 62	19,238	18,440	− 4	46,265	28,717	− 38
Muskegon–Norton Shores–Muskegon Heights	1,009	1,032	+ 2	4,112	7,103	+ 73	5,121	8,135	+ 59
Saginaw	5,727	1,069	− 81	5,794	4,965	− 14	11,521	6,034	− 48
Toledo	24,737	23,774	− 4	24,423	41,377	+ 69	49,160	65,162	+ 33
Michigan	363,545	303,114	− 17	274,578	230,055	− 16	638,123	533,169	− 16
United States	4,052,600	5,345,400	+ 32	4,434,900	5,929,000	+ 34	8,484,500	11,274,400	+ 32

SOURCE: F. W. Dodge Division of McGraw-Hill Information Systems Company, news releases.

NOTE: Battle Creek includes Barry and Calhoun counties; Detroit includes Lapeer, Livingston, Macomb, Oakland, St. Clair, and Wayne counties; Flint includes Genesee and Shiawassee counties; Grand Rapids includes Kent and Ottawa counties; Kalamazoo-Portage includes Kalamazoo and Van Buren counties; Lansing–East Lansing includes Clinton, Eaton, Ingham, and Ionia counties; and Muskegon–Norton Shores–Muskegon Heights includes Muskegon and Oceana counties.

a. Excludes nonbuilding construction contracts. This category comprises streets and highways, bridges, dams, reservoirs, river and harbor developments, sewerage and water supply systems, missile and space flight facilities, airports, utilities, and communication systems. For Michigan the 1980 and 1981 figures for nonbuilding construction contracts were $168,545,000 and $163,877,000 respectively, or a decrease of 3 percent. U. S. figures for nonbuilding construction contracts were $2,457,700,000 and $2,629,800,000 or an increase of 7 percent.

Quarterly Motor Vehicle Employment and Assembly

Item	1978		1979				1980				1981
	3	4	1	2	3	4	1	2	3	4	1
EMPLOYMENT[a]											
Checker											
Michigan	1,084	1,140	1,207	1,194	1,182	1,099	982	803	735	882	921
Chrysler											
Michigan	75,187	81,664	75,316	70,238	58,182	55,456	47,273	43,235	40,733	44,452	36,921
United States	125,989	135,997	125,899	118,532	99,754	98,228	86,341	78,908	73,248	80,321	68,024
Ford[b]											
Michigan	126,300	135,377	132,298	129,526	117,630	111,790	104,321	92,458	86,528	100,033	95,231
United States	233,314	253,536	245,253	240,054	211,763	196,038	181,595	160,226	144,068	172,827	160,595
General Motors											
Michigan	267,000	289,000	295,000	296,000	291,000	288,000	267,000	237,000	220,000	253,000	256,000
United States	594,000	643,000	644,000	650,000	582,000	602,000	561,000	499,000	469,000	538,000	535,000
ASSEMBLY											
Dearborn	39,072	83,017	96,572	92,774	85,970	68,819	65,971	70,823	49,852	54,856	29,179
Detroit	54,857[c]	89,563[c]	130,475[c]	113,866[c]	56,399[c]	78,055[c]	57,044[c]	40,016[c]	32,540[c]	102,410[c]	109,906[c]
Detroit (truck)	11,142	30,753[c]	33,693[c]	28,503[c]	12,861[c]	16,534[c]	14,812[c]	5,865	1,687	4,717	7,778
Flint	76,157	109,192	115,405	110,135	56,914	90,222	69,179	65,568	54,201	71,213	74,914
Flint (truck)	103,549	104,839	114,846	95,075	60,985	75,541	70,123	19,975	12,605	68,449	57,829
Hamtramck	56,808	54,230	44,901	62,806	13,345	30,134	1,031[c]	c	c	c	c
Kalamazoo	809	1,019	1,134	1,268	1,203	1,161	770	810	762	855	628
Lansing	62,327	116,726	130,644	130,363	72,684	96,143	104,913	82,558	56,769	85,367	91,196
Pontiac	61,666	82,652	91,712	85,977	46,578	61,082	50,974	30,102	26,077	39,831	30,439
Pontiac (bus & truck)	61,741	72,398	77,144	73,922	51,628	42,135	33,850	24,376	21,831	21,295	26,584
Warren (bus & truck)	72,181	84,504	76,365	48,873	5,027	19,043	14,783	28,537	16,498[R]	17,363	17,735
Wayne	63,214	55,607	50,477	46,765	34,081	28,800	27,840	37,401	24,039	67,854	74,448
Wayne (truck)	48,390	52,388	56,052	51,994	21,305	34,256	25,355	7,751	11,890	21,362	18,014
Wixom	36,508	46,902	51,132	36,527	20,013	32,604	8,724	6,896	15,393	19,914	13,695
Ypsilanti	57,178	38,891	38,797	75,420	73,508	70,507	84,598	83,147	66,919	78,277[R]	79,205
Total Michigan											
Passenger car	508,596	654,346	751,250	755,901	462,695	557,527	471,044	417,321	326,552	520,577[R]	503,610
Bus and truck	297,003	368,325	358,100	298,367	151,806	187,509	158,923	86,504	64,511	133,186	127,940
Total United States											
Passenger car	1,850,701	2,398,411	2,411,307	2,482,907	1,655,546	1,884,756	1,783,732	1,632,826	1,259,897	1,697,792	1,553,901
Bus and truck	851,998	982,232	1,024,655	916,996	529,092	564,118	499,525	350,607	307,817	476,234	449,288
Total Canada											
Passenger car	229,593	297,157	307,823	281,806	171,427	227,966	225,969	228,428	162,183	228,393	185,206
Bus and truck	120,199	180,355	200,162	190,698	107,988	135,532	146,015	136,314	95,798	144,764	143,080

SOURCE: Ward's *Automotive Reports;* Motor Vehicle Manufacturers Association of the United States, Inc., P-I report; and companies.

a. Average monthly wage and salary employment of companies with assembly plants in Michigan; includes nonautomotive.

b. Excludes Ford Aerospace and Communications Corporation and finance and insurance subsidiaries.

c. Chrysler's Jefferson Avenue plant was converted to truck production in September 1978. It was returned to car production in August 1980 after having been closed since March 1980. Chrysler's Hamtramck plant closed January 4, 1980.

R: Revised.

(Continued from page 3)

TABLE 1 (Cont.)

Item	Michigan	Indiana	Ohio	Total
Do you buy the local newspaper?				
Yes	107	54	29	204
No	165	141	136	471
Do you feel Grayling provides enough activities for—				
Children?				
Yes	151	59	91	303
No	32	28	18	85
Don't know	90	109	56	286
Teenagers?				
Yes	142	59	88	295
No	42	32	19	100
Don't know	89	105	58	282
Adults?				
Yes	186	81	86	363
No	35	35	33	113
Don't know	52	80	46	201
Do you find people friendly and courteous?				
Yes	241	175	146	597
No	22	14	10	50
Don't know	10	7	9	30
What activities do you like best in Grayling?				
No time for them	2	1	2	5
Nothing	12	24	8	47
Partying	8	14	12	37
Camping	17	8	15	41
Fishing	28	3	14	48
Relaxing on beach	85	39	75	213
Other	93	77	44	230
Do you feel there is adequate transportation in the area?				
Yes	147	103	67	334
No	81	67	57	224
Don't know	37	21	36	100
Have you made any friends in Grayling?				
Yes	197	86	84	383
No	75	109	81	293
Would you, or do you, come to Grayling at times other than training?				
Yes	213	100	85	417
No	57	94	80	255
If yes, in what season?				
Spring	11	8	6	20
Summer	59	43	37	151
Fall	72	23	34	131
Winter	34	33	20	88
All	87	5	14	109
If no, why not?				
Distance	6	50	32	100
Too expensive	12	6	10	28
Don't want to	41	27	37	115
Don't know	0	6	1	7
What added business would you like to see in Grayling?				
Adequate	99	71	61	240
Don't know	35	59	39	154
K-Mart	28	5	24	57
Burger King	6	4	3	13
Kentucky Fried Chicken	7	4	8	19
Gym	17	4	1	25
Pool hall	8	13	4	27
Other	77	35	38	156
What added services would you like to have in Grayling?				
Adequate	121	84	69	281
Transportation	55	10	37	109
Don't know	45	47	39	147
Information	23	17	9	55
Other	23	22	10	61
Prostitution	14	3	2	10
What do you miss from home that you can't have here?				
Family	73	88	87	274
Friends	38	23	16	79
Car	14	5	8	34
T.V.	8	5	8	22
Other	34	19	10	66
Nothing	102	40	43	190
Everything	9	2	1	13
Don't know	6	7	1	14
How much money did you, and your family, spend in the Grayling area?				
Responded to this question	270	187	163	657
Average expenditures among those responding	$207	$167	$197	$194

The Toledo War

The following official version of the Toledo War, described as "An Ohio Idea," was published in Adjutant General Jno. Robertson's Michigan in the War, *rev. ed. (Lansing: W. S. George & Co., State Printers and Binders, 1882), pp. 1028–32. Most of the book is about the Civil War. It seems worth pointing out that the list of officers who participated in the Toledo War includes Alpheus Felch, Aide-de-camp. Felch was later governor of and U. S. senator from Michigan.*

Also included below is material on Harper Hospital from pp. 115–16.

What is known as the Toledo War was one of a very peculiar and harmless character, beginning in perspective and ending without collision, fight, or casualty; yet exhibiting on the start on both sides a maximum of bombastic threatenings, prospective of possible coming war, with bloody battles and direful consequences, and although it brought out on the part of Michigan the most formidable military demonstration incident to a dispute, between States as to territory occurring in the United States, it ended in a wordy peace, which has resulted in handing down the whole affair, both civil and military, in undeserved traditional and written ridicule.

In the beginning of 1835 the State of Ohio undertook to enforce jurisdiction over certain territory south of the Maumee Bay, which was then considered as a portion of Michigan Territory, and claimed as such. The legislative council of Michigan on February 12, of that year, passed an act "to prevent the exercise of foreign jurisdiction within the limits of the Territory of Michigan," making it a penal offense for any one to accept or exercise any public office in any part of the Territory, except by commission from the United States, or Michigan. On the 19th of the same month Acting Governor Mason, in a letter of instructions in detail to General Joseph W. Brown, then commanding a division of the Michigan militia, says: "Under existing circumstances but one of two courses is left for Michigan to pursue. If Ohio continues to persevere in the attempt to wrest from us our territory, as she now meditates,—in voluntary submission to encroachment upon our rights, or firm and determined opposition to her,—the latter though painful to us, is preferable to the former, and must be decided upon. With this in view, I have, with due regard to the important task assigned you, concluded to give you the control of the measures necessary to be adopted in

consequence of the peculiar and unpleasant relations which I fear may soon exist between the civil authorities of Ohio and those of this Territory."

General Brown, under the same date, issues the following address to the militia:

"FELLOW CITIZENS,—A cause which has the sanction of the highest authority in the nation, as well as the laws of our Territory, must be sustained by us, and will meet the approbation of all our common country who respect our institutions and who are capable of appreciating the just claims of the injured and weaker party when they are sought to be trodden down and trampled upon by mere physical force. We cannot submit to an invasion of our soil; we are determined to repel with force whatever strength the State of Ohio may attempt to bring into our Territory to sustain her usurpations, and let the consequences which may follow rest on the guilty heads of those who attempt to deprive us by force of our rightful jurisdiction."

On the 23d following the Ohio Legislature asserting the right of that State and declaring that measures should be taken to establish it, Governor Lucas placed a Major General of militia in command, with instructions to enroll the militia of the districts in dispute for the purpose of protection, while running a boundary line which Ohio insisted on accomplishing. The matter of boundary had been laid before Congress, but failed to receive attention, and the acting Governor of Michigan, considering his Territory in possession, ordered General Brown to hold himself in readiness to resist any attempt of Ohio to carry out the threatened measures, the right of Michigan being sustained by the Attorney General of the United States, and also by the President and his advisers. After a futile attempt at conciliation and considerable delay, Ohio still persisting in her claim, the President intimated by letter that if that State attempted running the lines with an armed force he would have to interfere to prevent it by the power of the United States. Still affairs remained quiet, with an occasional difficulty, but without any military demonstration. It was ascertained, however, that in accordance with the views of the Ohio Legislature a new county (Lucas) was to be organized over the disputed territory, and that a court was to be opened at Toledo on the 7th of September, 1835, and that this move was to be protected by Ohio troops. To meet this contemplated action Governor Mason ordered out the Michigan forces, and with them in person moved on Toledo; but on arriving there no opposing force was encountered and he peacefully took possession of the place, holding it for four days, when the Michigan troops, under an order of September 10th, returned and were disbanded at their various rendezvous, not having fired a gun at an enemy nor lost a man.

Ohio finally succeeded by strong political influence in obtaining the disputed ground, but only with what was claimed to have been the consent of Michigan, in lieu of which she received what is known as the Upper Peninsula.

Following is a statement of the officers and troops organized and called out by the Governor to take a part in the boundary quarrel referred to, and who were paid by the State for their services:

Governor, Stevens T. Mason. Staff: Colonels Isaac S. Rowland, Kintsign Pritchette, John Chester.

Major General Joseph W. Brown, commanding; Alpheus Felch, Aid-de-Camp; Charles W. Whipple, Division Inspector; Daniel S. Bacon, Division Quartermaster.

Brigadier General Martin Davis commanding 2d Brigade. E. C. Eaton, Brigade Major; J. E. Field, Brigade Quartermaster; Isaac J. Ullman, Brigade Inspector.

FIRST REGIMENT RIFLES.

FIELD AND STAFF.

J. D. Davis, Colonel; John Beedon, Jr., Major; F. L. Marcham, Surgeon; Peter Fralick, Paymaster; H. A. Noyes, Adjutant; Wm. McCurdy, Quartermaster.

COMPANY OFFICERS.

Captains, Albert Stroms, Richard Boughton, Charles M. McCormick, Eli Derby, Emery Richardson, A. D. Crane, James M. Murray, Horace Leek, S. B. Newton (supernumerary in charge of baggage train).

First Lieutenants, Ezra Bradner, Samuel Gates, Isaac Hiscock, Jr., Silas Dickenson, J. S. Lacey, Jacob I. Foot, Jared B. Cornish, Cyrus Burnett.

Second Lieutenants, Enos Bradner, Wm. A. Ballard, Samuel B. Hill, Edwin Bond, Henry B. H. Secord, Harvey Barton, Wm. Brewer, Norman C. Wells.

This command was made up of portions of eight companies, varying in size, and numbering 189 officers and men in the aggregate.

SECOND REGIMENT INFANTRY.

FIELD AND STAFF.

Warner Wing, Colonel; Apulus Drown, Major; Wm. W. Smith, Surgeon; Lewis E. Bradley, Adjutant; Almon H. White, Quartermaster.

COMPANY OFFICERS.

Captains, George W. Darrah, Joseph Morass, Gabriel Bissonette, Heman N. Spalding, Noyes W. Woodworth, John Bradford.

First Lieutenants, Levi Lewis, Francis Cousins, George C. Root, David Hall.

Second Lieutenants, Nelson White, John B. Derby.

Ensigns, James H. Withington, Peter Moran.

The force consisted of parts of seven companies, numbering 131 officers and men.

EIGHTH REGIMENT INFANTRY.

FIELD AND STAFF.

Davis Smith, Colonel; Samuel B. Evans, Lieutenant Colonel; Derastus Torrey, Major; Michael A. Patterson, Surgeon; Alonzo Cressy, Ass't Surgeon; Joseph E. Hall, Adjutant; Sydney F. Blanchard, Quartermaster; Thomas Sisson, Assistant Quartermaster; Hugh Hillock, Assistant Quartermaster.

COMPANY OFFICERS.

Captains, Reuben N. Hall, John Densmore, Peleg Pettis, Horatio N. Baldwin, Ebenezer Davis, Augustus Montgomery, Jedediah Raymond, Milton Hoag.

First Lieutenants, Eli Chatfield, Asa G. Edwards, Guy Carpenter.

Second Lieutenants, Joseph N. Chandler, John J. Adam, Adam Miner, J. Swick, Daniel McRoberts.

Ensigns, Benjamin Tibbetts, Simeon Spencer.

This regiment had eight small companies, 238 strong, in the aggregate.

OAKLAND DETACHMENT.

FIELD AND STAFF.

Frederick A. Sprague, Major; Andrew D. Voorheis, Surgeon; Israel B. Richardson, Surgeon; Benjamin Phelps, Paymaster; John L. Brownell, Quartermaster.

COMPANY OFFICERS.

Captains, Orange Foot, George Brownell, Linus Cone, John W. Ingram, Haron Haskins.

First Lieutenants, Mason I. James, Walter Drake, Nelson Rosevelt, Phineas W. Jenney, Edward W. Peck.

Second Lieutenants, Alanson Goodrich, William Lee, Henry Sprague, Calvin Chapel, Hiram Carhart. Chester Goodrich, Cornet.

This detachment was 180 strong, a portion of it being mounted as cavalry.

BUCKLIN'S DETACHMENT INFANTRY.

FIELD AND STAFF.

James Bucklin, Major; James Dunn, Adjutant.

COMPANY OFFICERS.

Captains, N. P. Thayer, John F. Rupley, James Goodell, Thomas Geldard, Martin Greenman, Asahel L. Bird, Chas. M. Bull, George B. Griswold.

First Lieutenants, Paul Rice, John Thomas, Sheldin Beckwith, Lewis Fuller, Geo. C. Bates, Sidney L. Rood.

Second Lieutenants, Jasper Thomas, Jacob M. Howard, Thomas Dare.

Ensign, Joseph Y. Davis.

This command had an aggregate of 137 officers and men.

SHELBY VOLUNTEERS, ARTILLERY.

Captains, Orson Sheldon, A. White, Erastus Day, J. O. Ferris, N. W. Wadsworth.

Lieutenants, James St. John, Wm. H. Webster, Elias O. Maccall.

Ensigns, Gurdon C. Leech, C. C. Douglass.

This artillery force was made up of gun squads, 57 officers and men.

DETROIT LIGHT DRAGOONS.

First Lieutenant, John Wright; Second Lieutenant, Simeon Brown; Third Lieutenant, James Hanmer.

This company was 20 strong in the aggregate.

LIGHT HORSE.

Captain, Joseph Wood; First Lieutenant, James McBride; Second Lieutenant, Burton Hotchkiss; Stephen Crego, Cornet.

This company numbered 40 officers and men.

Harper Hospital

In 1863, Colonel Charles S. Tripler, surgeon U. S. army, and then U. S. medical director, stationed at Detroit, represented to the Government the absolute necessity for the erection of a general hospital at that point for the reception and care of sick and wounded Michigan soldiers, and urging immediate action in the matter.

In the effort Colonel Tripler had the influence and recommendation of the Governor and military authorities of the State, and was at the same time ably aided in his undertaking by Dr. D. O. Farrand, then assistant surgeon, U. S. army, and Colonel George W. Lee, chief quartermaster in Michigan, and stationed at Detroit.

The authority was, after much correspondence and annoying delays, obtained under an order from the Secretary of War, and under the superintendence of Colonel Lee the work on "Harper Hospital" was commenced early in 1864.

It was made up of eleven one-story buildings, with a capacity for eight hundred patients, and costing about sixty thousand dollars, the use of the grounds being given gratis by the "Harper Hospital Association." Much care had been observed in regard to ventilation, drainage, and superior water arrangements. Opening with an exceedingly capable management, it had soon the reputation of being one of the most complete, comfortable, and best regulated hospitals in the West.

In usefulness it added largely to the already extensive preparation made by the Government for the shelter and care of thousands of Michigan men who, by disease or wounds, had been rendered unfit for service in the field.

On its completion, Dr. Farrand was placed in charge, with Drs. W. A. Chandler, Wm. C. Catlin, E. W. Jenks, and G. W. Fitzpatrick as assistants. Dr. Byron Stanton, a surgeon of volunteers, succeeded Dr. Farrand in the spring of 1865, but he remained but a few weeks, as he accepted a position in an asylum for the insane in Ohio.

Dr. Farrand again assumed charge, continuing on duty until June or July following, when at his own request he was transferred to take charge of the hospital at Fort Wayne, near Detroit, then occupied by U. S. troops.

Succeeding Dr. Farrand, Dr. Wynkoop, a surgeon of volunteers from Philadelphia, was placed in charge, remaining until the close of the hospital, in December, 1865.

The buildings were soon after given by the Government to the trustees of the "Harper Hospital," a corporate body, this association having in contemplation the establishment of a hospital for charitable purposes.

In giving the buildings, the Government made a condition that sufficient accommodation should be at all times afforded for a "Soldiers' Home" for invalid and destitute Michigan soldiers and sailors, and since then it has been in part used for that purpose.

The sick and wounded being very numerous at that time, and a transfer of Michigan men from Eastern hospitals being very desirable, to ensure them more care and the attention of their friends at home, the erection of this hospital was accomplished, and while it was accepted by the people of the State as a most generous recognition by the Government of her great claims for consideration, they will never forget the efforts of those gentlemen to secure it, while the soldiers will in all time hold them in most grateful remembrance.

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COUNTY ECONOMIC PATTERNS

by DAVID I. VERWAY, *Professor, Bureau of Business and Economic Research, Graduate School of Business Administration, Michigan State University*

Corn, beef, and dairy farmers enjoyed a prosperous 1979; that is the principal reason for the favorable economic performances in Ogemaw, Gladwin, Missaukee, and Alcona counties, growth leaders in the state between 1978 and 1979. In Livingston, Kent, Cheboygan, Otsego, and Shiawassee counties, manufacturing provided the impetus. Tuscola, Saint Joseph, and Huron counties benefited from a good year for field crops generally. Data on overall earnings change for Michigan counties are shown in Table 1.

Fruit farming was the nemesis in Leelanau, Berrien, and Newaygo counties, whereas manufacturing was responsible for the poor perform-

TABLE 1

Listing of Michigan Counties According to Growth in Labor and Proprietors' Earnings, by County in Which Earned: 1978–1979

County	Percentage change 1978–1979	County	Percentage change 1978–1979	County	Percentage change 1978–1979
Ogemaw	23	Ingham	13	Mackinac	10
Gladwin	22	Lenawee	13	Alger	10
Missaukee	20	Antrim	12	Houghton	10
Alcona	19	Washtenaw	12	Oceana	9
Livingston	18	Branch	12	Oscoda	9
Kent	17	Hillsdale	12	Saginaw	9
Cheboygan	16	Osceola	12	Calhoun	9
Otsego	16	Wexford	12	Bay	9
Tuscola	16	Eaton	12	Monroe	9
St. Joseph	16	Midland	12	Lake	9
Shiawassee	16	Gogebic	12	Lapeer	8
Huron	15	Schoolcraft	12	Montcalm	8
Ottawa	15	Ontonagon	12	Iosco	8
Oakland	15	Allegan	11	Ionia	7
Presque Isle	15	Benzie	11	Macomb	7
Dickinson	15	Alpena	11	Genesee	7
Sanilac	14	Mecosta	11	Wayne	7
Clare	14	Muskegon	11	Gratiot	7
Mason	14	Kalkaska	11	Newaygo	6
Barry	14	Luce	11	Berrien	6
Kalamazoo	14	Delta	11	St. Clair	6
Roscommon	14	Iron	11	Chippewa	6
Arenac	14	Marquette	10	Montmorency	5
Clinton	13	Van Buren	10	Keweenaw	5
Grand Traverse	13	Baraga	10	Crawford	−4
Charlevoix	13	Isabella	10	Leelanau	−7
Menominee	13	Manistee	10	Michigan	10
Emmet	13	Jackson	10	United States	12

SOURCE: Bureau of Economic Analysis, Regional Economics Information System.

NOTICE

Effective 30 June, the Bureau of Business and Economic Research at Michigan State University will be dissolved. THE MICHIGAN STATE ECONOMIC RECORD no longer will be published by the Graduate School of Business Administration here.

I wish to express deepest appreciation to our readers and authors who have contributed to the high quality of this publication through the years. It is with regret that we say this final good-bye.

Richard J. Lewis, Dean
Graduate School of Business Administration

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ance in Crawford, Keweenaw, Montmorency, Chippewa, Gratiot, Cass, and Ionia counties. Wayne, Genesee, and Macomb counties experienced all-around sluggishness because of their heavy emphasis on the automotive sector.

Bureau of Economic Analysis (BEA) county earnings estimates are developed from reports that employers file with state employment agencies and from tax returns filed with the Internal Revenue Service. Total earnings are comprised of labor income and the net incomes of nonincorporated business enterprise, such as proprietary motels, restaurants, and grocery stores, as well as the business of professionals, such as physicians, dentists, lawyers, and trade contractors. These data are the best available yardsticks of economic activity taking place in counties, although they are not as comprehensive as gross national product accounts for the United States.

Table 2 has been prepared to highlight the importance of goods production in Michigan counties. Except for Midland and Manistee, where the manufacture of chemicals is a dominant force, the top ten counties in manufacturing owe their positions to the automotive industry and its suppliers. Several northern counties top the list in construction activity. Except for Midland, where Consumers Power Company is building a nuclear reactor, residential construction is predominant due to an influx of new residents, particularly from southeast Michigan. Mining activity is vital to a few counties in the Upper Peninsula and to Kalkaska, which is a focal point in the production of natural gas. Two plants in Kalkaska process much of the gas produced in northern Michigan.

The counties, other than Oakland, listed in the first two columns in the top panel of Table 3 are ones in which

TABLE 2

Analysis of Personal Income in Goods Producing Industries in Michigan Counties: 1978–1979

Agriculture			Manufacturing			Construction			Mining		
County	*Dependency*[a]	*Growth 1978–1979*[b]	*County*	*Dependency*[a]	*Growth 1978–1979*[b]	*County*	*Dependency*[a]	*Growth 1978–1979*[b]	*County*	*Dependency*[a]	*Growth 1978–1979*[b]
Ten most dependent counties											
Missaukee	28.82	23	Genesee	59.16	5	Kalkaska	18.71	10	Ontonagon	50[c]	n.a.
Huron	21.29	27	Midland	54.32	12	Midland	18.13	8	Presque Isle	35[c]	n.a.
Sanilac	21.27	67	Saginaw	53.75	5	Montmorency	14.73	8	Marquette	25[c]	n.a.
Oceana	18.90	−20	St. Joseph	52.16	11	Alcona	14.65	1	Kalkaska	20[c]	n.a.
Cass	17.31	73	Macomb	52.08	2	Benzie	12.25	18	Schoolcraft	17[c]	n.a.
Clinton	16.57	35	Lenawee	49.15	9	Iron	12.16	10	Mackinac	15[c]	n.a.
Leelanau	14.60	−49	Manistee	48.00	10	Cheboygan	12.05	9	Dickinson	10[c]	n.a.
Tuscola	13.70	80	Berrien	47.47	5	Leelanau	10.50	−2	Isabella	7.25	11
Gratiot	13.19	17	Wayne	47.11	5	Ottawa	10.46	32	Iron	3[c]	n.a.
Arenac	12.70	46	Muskegon	46.43	9	Gr. Traverse	9.68	18	Chippewa	2[c]	n.a.
Ten least dependent counties											
Crawford	0	—	Presque Isle	3.09	8	Ontonagon	1.70	D	Alger	0	0
Keweenaw	0	—	Marquette	3.46	23	Luce	1.77	−3	Baraga	0	0
Wayne	.02	−3	Chippewa	3.69	−6	Keweenaw	2.00[c]	n.a.	Benzie	0	0
Oakland	.05	−4	Lake	4.33	n.a.	Lenawee	2.69	6	Branch	0	0
Marquette	.13	—	Luce	4.55	12	Cass	2.75	−8	Keweenaw	0	0
Genesee	.17	−4	Mackinac	4.85	15	Arenac	2.83	11	Lake	0	0
Macomb	.25	−4	Leelanau	6.60	−4	Washtenaw	3.01	10	Luce	0	0
St. Clair	.33	−79	Houghton	6.92	5	Sanilac	3.05	5	Menominee	0	0
Roscommon	.37	—	Keweenaw	7.33	−14	Schoolcraft	3.06	−6	Oscoda	0	0
Alpena	.55	373	Missaukee	7.59	17	Hillsdale	3.15	10	Alcona	.10[c]	n.a.
Ten fastest growing counties											
Chippewa	1.67	888	Isabella	6.41	35	Benzie	24.61	36	D		
Emmet	2.03	675	Gratiot	3.88	33	Otsego	23.33	26	D		
Mackinac	1.28	456	Ottawa	10.46	32	Cheboygan	27.81	25	D		
Iosco	1.28	433	Montcalm	4.74	28	Ogemaw	24.39	25	D		
Dickinson	1.41	424	Kalamazoo	5.77	24	Oceana	17.52	24	D		
Clare	3.66	387	Ionia	3.48	24	Marquette	3.46	23	D		
Alpena	.55	373	Lapeer	5.69	23	Emmet	17.11	22	D		
Charlevoix	1.97	224	Jackson	4.80	23	Gladwin	22.05	22	D		
Presque Isle	5.94	220	Muskegon	7.16	22	Kent	39.73	22	D		
Ogemaw	7.95	204	Van Buren	9.16	20	Alcona	23.40	21	D		
Michigan	1.17	30	Michigan	4.87	10	Michigan	42.54	7	Michigan	.22	78
U.S.	2.52	18	U.S.	6.11	13	U.S.	26.11	12	U.S.	.42	93

SOURCE: Bureau of Economic Analysis, Regional Economics Information System.
a. Earnings in this sector as a percentage of total labor and proprietors' earnings in 1979.
b. Percentage change in labor and proprietors' earnings in this sector.
c. Estimated by the author.
D. Data not available for several important mineral producing counties.
n.a.: not available.

tourism is important to the local economies. The services and trade industries responsible for those high rankings include lodgings, restaurants, gasoline service stations, and party stores. The distinguishing factor in the third column is the presence of electric generating equipment or headquarters of utility companies. In the fourth column, Livingston, Lake, Gladwin, Roscommon, Missaukee, and Montmorency counties have high levels of real estate activity, whereas Oakland, Calhoun, Grand Traverse, and Houghton counties are financial centers in their areas.

The proportion of earnings derived from wholesale trade (not shown in Table 3) was greatest in Dickinson County (9.3 percent), followed by Oakland (9.1 percent) and Kent (8.2 percent). The federal government was the dominant factor in Keweenaw (41.6 percent) and Iosco (37.5 percent), and a combination of state and local government was dominant in Luce (69.6 percent) and Mecosta (42.5 percent). Keweenaw County has an Air Force radar station near its northern tip, Iosco hosts Wurtsmith Air Force Base, Luce is the home of Michigan's Newberry Regional Health Center, and Ferris State College is located in Mecosta County.

RESIDENCE ADJUSTMENT

The numbers in Tables 1 through 3 focus on economic activity taking place within counties, regardless of where the earnings recipients live. To calculate income received by persons, by county, the BEA has developed residence adjustments. For example, in 1978, residents of other counties earned $18,347,000 more in Ontonagon than Ontonagon residents earned elsewhere (see Table 4). That figure constitutes more than one-third of total earnings generated in the county. Others exporting a large percentage of earnings or, what amounts to the same thing, importing a large percentage of labor, are Ingham, Washtenaw, and Midland. Although Wayne ranks fifth in the

TABLE 3
Analysis of Personal Income in Selected Nongoods Producing Industries in Michigan Counties: 1978–1979

Selected services			Retail trades			Transportation and public utilities			Finance, insurance, and real estate		
County	*Dependency*[a]	*Growth 1978–1979*[b]	*County*	*Dependency*[a]	*Growth 1978–1979*[b]	*County*	*Dependency*[a]	*Growth 1978–1979*[b]	*County*	*Dependency*[a]	*Growth 1978–1979*[b]
Ten most dependent counties											
Emmet	29.62	13	Clare	21.64	10	St. Clair	15.27	15	Livingston	7.02	10
Leelanau	25.32	11	Missaukee	20.68	26	Jackson	12.94	10	Lake	6.54	4
Crawford	25.03	9	Roscommon	20.53	8	Monroe	12.17	18	Oakland	6.14	14
Oakland	20.79	14	Lake	19.59	20	Chippewa	11.59	5	Calhoun	5.58	n.a.
Gr. Traverse	20.62	15	Mackinac	18.85	11	Shiawassee	10.79	23	Gladwin	5.43	15
Mackinac	19.60	10	Crawford	18.84	16	Alpena	10.15	29	Roscommon	5.14	7
Wexford	17.16	16	Ogemaw	17.86	25	Houghton	10.00[a]	n.a.	Gr. Traverse	4.95	18
Baraga	16.85	27	Cheboygan	17.73	9	Delta	9.84	15	Missaukee	4.81	15
Otsego	16.64	32	Montmorency	17.43	4	Mason	9.39	19	Houghton	4.78	−19
Clare	16.53	24	Arenac	16.97	8	Dickinson	8.61	14	Montmorency	4.65	38
Ten least dependent counties											
Ontonagon	5.20	27	Midland	5.23	8	Keweenaw	1.00[a]	n.a.	Kalkaska	.50[c]	n.a.
Kalkaska	5.48	12	Washtenaw	6.29	9	Montmorency	1.35	13	Alcona	.95	n.a.
Menominee	6.11	1	Genesee	6.79	7	Antrim	1.57	20	Keweenaw	1.00[c]	n.a.
Montmorency	6.16	19	Ontonagon	7.16	10	Osceola	1.65	21	Midland	1.34	12
St. Joseph	6.42	14	Wayne	7.29	6	Leelanau	1.77	24	Allegan	1.40	14
Missaukee	6.44	8	Ingham	7.60	11	Oscoda	1.81	18	Luce	1.45	10
Branch	6.52	7	Cass	7.81	2	Ontonagon	1.83	2	Ogemaw	1.67	8
Osceola	6.80	11	Saginaw	7.89	11	Clinton	2.04	10	Presque Isle	1.96	22
Ionia	7.88	13	Hillsdale	8.16	2	Missaukee	2.14	41	Baraga	2.00[c]	n.a.
Tuscola	8.07	11	Luce	8.17	6	Luce	2.15	32	Tuscola	2.00	17
Ten fastest growing counties											
Otsego	16.64	32	Missaukee	20.68	26	Midland	2.79	43	Otsego	2.94	38
Monroe	13.30	30	Gratiot	9.68	25	Missaukee	2.14	41	Montmorency	4.65	27
Baraga	16.85	27	Ogemaw	17.86	25	Luce	2.15	32	Washtenaw	2.12	22
Ontonagon	5.20	27	St. Joseph	8.69	25	Alpena	10.15	29	Presque Isle	1.96	21
Clare	16.53	24	Menominee	8.81	23	Eaton	2.52	26	Clare	3.54	19
Ottawa	12.01	24	Lake	19.59	20	Benzie	6.81	26	Dickinson	2.07	19
Roscommon	11.92	23	Livingston	15.45	20	Leelanau	1.77	24	Macomb	2.00	19
Cheboygan	15.93	22	Otsego	14.18	19	Shiawassee	10.79	23	Gr. Traverse	4.95	18
Oscoda	10.06	21	Clinton	12.77	18	Ottawa	4.40	22	Ottawa	2.30	18
Van Buren	11.54	20	Oscoda	13.91	18	Arenac	3.95	21	Sanilac	2.65	18
Michigan	14.20	14	Michigan	8.79	10	Michigan	5.54	12	Michigan	2.88	11
U.S.	17.10	14	U.S.	9.92	12	U.S.	7.72	14	U.S.	5.81	15

SOURCE: Bureau of Economic Analysis, Regional Economics Information System.
a. Earnings in this sector as a percentage of total labor and proprietors' earnings.
b. Percentage change in labor and proprietors' earnings in this sector.
c. Estimated by the author.
n.a.: not available.

The MICHIGAN STATE ECONOMIC RECORD

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Michigan Economic Indicators

Item	Year previous of latest month	Previous month	Latest month
Manufacturing workers:			
Average weekly hours, Michigan	40.2	39.1	41.0 (Mar.)
Average weekly hours, U.S.	39.6	39.5	39.9 (Mar.)
Average hourly earnings, Michigan ($)	9.34	10.11	10.23 (Mar.)
Average hourly earnings, U.S. ($)	7.06	7.74	7.79 (Mar.)
U.S. motor vehicle production (units)	709,650	807,352	808,949 (May)
Michigan electricity usage (mil. kwh.)	6,079	5,718	5,953 (Mar.)
Industrial (mil. kwh.)	2,713	2,624	2,707 (Mar.)
Residential (mil. kwh.)	1,946	1,786	1,840 (Mar.)
Raw steel production:			
Michigan (000 net tons)	803	827	798 (Apr.)
United States (000 net tons)	10,658	11,774	11,243 (Apr.)
Consumer price index (1967 = 100)			
Detroit area	248.2	268.2	272.4 (Apr.)
United States	242.5	265.1	266.8 (Apr.)
U.S. wholesale price index (1967 = 100)	263.7	292.8	293.7 (May)
Michigan farm prices received index (1967 = 100)	226	260	264 (Apr.)

SOURCES: U.S. Bureau of the Census; U.S. Bureau of Labor Statistics; Michigan Crop Reporting Service; Motor Vehicle Manufacturers Association, Inc.; American Iron and Steel Institute; and Energy Information Administration.

Contracts for Future Building, First 4 Months: 1980 and 1981

(Thousands of Dollars)

Area	Nonresidential 1980	Nonresidential 1981	Nonresidential Percentage change	Residential 1980	Residential 1981	Residential Percentage change	Total[a] 1980	Total[a] 1981	Total[a] Percentage change
Ann Arbor	46,191	22,677	− 51	7,500	15,663	+109	53,691	38,340	− 29
Battle Creek	3,546	4,613	+ 30	2,737	4,173	+ 52	6,283	8,786	+ 40
Bay City	1,015	2,618	+158	11,083	1,807	− 84	12,098	4,425	− 63
Detroit	263,980	272,352	+ 3	167,965	135,964	− 19	431,945	408,316	− 5
Flint	28,310	15,319	− 46	8,418	12,561	+ 49	36,728	27,880	− 24
Grand Rapids	71,043	26,366	− 63	35,556	36,960	− 4	106,599	63,326	− 41
Jackson	5,175	7,847	+ 52	2,859	5,376	+ 88	8,034	13,223	+ 65
Kalamazoo-Portage	11,399	13,193	+ 16	10,511	23,812	+127	21,910	37,005	+ 69
Lansing–East Lansing	29,937	13,401	− 55	26,419	32,544	+ 23	56,356	45,945	− 18
Muskegon–Norton Shores–Muskegon Heights	2,785	1,356	− 51	5,696	10,979	+ 93	8,481	12,335	+ 45
Saginaw	21,331	2,544	− 88	6,767	6,385	− 6	28,098	8,929	− 68
Toledo	39,133	71,470	+ 83	37,567	53,853	+ 43	76,700	125,323	+ 63
Michigan	522,543	409,650	− 22	358,946	370,684	+ 3	881,489	780,334	− 11

SOURCE: F. W. Dodge Division of McGraw-Hill Information Systems Company, news releases.

NOTE: Battle Creek includes Barry and Calhoun counties; Detroit includes Lapeer, Livingston, Macomb, Oakland, St. Clair, and Wayne counties; Flint includes Genesee and Shiawassee counties; Grand Rapids includes Kent and Ottawa counties; Kalamazoo-Portage includes Kalamazoo and Van Buren counties; Lansing–East Lansing includes Clinton, Eaton, Ingham, and Ionia counties; and Muskegon–Norton Shores–Muskegon Heights includes Muskegon and Oceana counties.

a. Excludes nonbuilding construction contracts. This category comprises streets and highways, bridges, dams, reservoirs, river and harbor developments, sewerage and water supply systems, missile and space flight facilities, airports, utilities, and communication systems. For Michigan the 1980 and 1981 figures for nonbuilding construction contracts were $218,648,000 and $345,057,000 respectively, or a decrease of 58 percent.

TABLE 4

Michigan Counties Most and Least Affected by Intercounty Commuting to Work: 1979

County	Labor and proprietors' earnings, by county in which received	(Dollar figures in thousands) Residence adjustment	Labor and proprietors' earnings, by county in which earned	Proportion[a]
		Top 10		
Eaton	194,000	392,864	586,864	.670
Clinton	129,916	248,752	378,668	.660
Huron	177,052	11,768	188,820	.623
Livingston	275,043	365,694	640,737	.571
Leelanau	32,359	30,163	62,622	.482
Lapeer	225,961	207,271	433,232	.480
Shiawassee	255,730	216,465	472,195	.460
Monroe	479,288	413,871	893,159	.434
Gladwin	43,365	32,460	75,825	.430
Barry	135,455	96,148	231,603	.420
		Bottom 10		
Genesee	3,943,348	421,674	3,521,674	−.1070
Delta	176,072	−2,036	174,036	−.1156
Kent	3,471,816	−409,517	3,062,299	−.1180
Grand Traverse	362,221	−43,543	318,678	−.1202
Wexford	125,632	−15,872	109,760	−.1234
Wayne	21,333,789	−2,941,850	18,391,939	−.1380
Midland	638,571	−113,519	525,052	−.1780
Washtenaw	2,637,598	−586,814	2,056,784	−.2202
Ingham	2,827,130	−777,431	2,049,699	−.2750
Ontonagon	54,448	−18,347	36,101	−.3370
Michigan	65,838,231	436,762	86,274,993	.0051
United States	1,404,637,000	−412,000	1,404,225,000	−.0003

SOURCE: Bureau of Economic Analysis, Regional Economics Information System.
a. Residence adjustment as proportion of labor and proprietors' earnings received (where positive) or generated (where negative).

County Economic Patterns

(Continued from page 3)

proportion of earnings going to outside residents, it has by far the largest sheer dollar volume.

In the sheer dollar volume of earnings imported, or labor exported, Oakland is first and Macomb second, although in the percentage ranking they are 39 and 19, respectively. These figures merely illustrate what is comcon knowledge—the dependence of Oakland and Macomb residents on Wayne County jobs is not inconsequential. In a relative sense, the greatest such dependence in this state is Clinton's reliance on Ingham.

PROPERTY INCOME AND TRANSFER PAYMENTS

Total personal income is the sum of earnings received and income that entails no labor in return. The latter has two components: property income and transfer payments. Property income is received as dividends, interest, and rent by the owners of capital. The nine Michigan counties that outrank the others in percentage of personal income derived from property, or capital, ownership are all located in the northern Lower Peninsula (see Table 5). It is to these counties that many workers retire when they leave Genesee, Wayne, Macomb, and the other industrial centers. They insulate their summer cottages for year-round occupancy.

Transfer payments include Social Security and other pensions, welfare benefits, unemployment compensation, and other income not linked to current production or to capital ownership. During 1979, Social Security (federal, old age, survivors, and disability insurance) payments in Michigan accounted for 43 percent of total transfer payments; welfare, 15 percent; Medicare, 13 percent; military retirement and veterans' benefits, 6 percent; unemployment benefits, 6 percent; and other items, 17 percent.

Lake County is more heavily dependent on transfer payments than any other Michigan county (see Table 6). It ranks first in welfare benefits as a percentage of personal income (4 percent), and second in Social Security benefits as a percentage of personal income (18.1 percent). The rankings in Table 6 reflect Social Security benefits more than anything else, because they are the major component of transfer payments. Northern Michigan counties rank high in this table for the same reason that they are located at the top of the list in Table 5.

PERSONAL INCOME

The sum of earnings received, property income, and transfer payments is a broad yardstick of the income available to persons. Per capita personal income (see Table 7) indicates how counties fare, on the average, in the acquisition of slices of the national "pie." Oakland County does exceptionally well in this regard because it has high paying industry and because well-paid workers with jobs elsewhere reside there. Macomb ranks second in Michigan for much the same reason. Michigan's other counties with heavy dependence on manufacturing also rank high in per capita income because the majority of those jobs are high paying.

Most northern Michigan counties in the Lower Peninsula have low per capita incomes because a high proportion of their residents are retirees living on accumulated

wealth and pensions. Also, the retail and service industries that cater to them and to summer visitors offer low paying jobs, for the most part. The area provides summer employment for high school and college students as well as for older workers who stay there. A survey of the economic condition of these counties would likely find that the residents of Roscommon, Leelanau, Montmorency, Alcona, Oscoda, Benzie, Emmet, and Antrim counties consider themselves to be well off financially. In contrast, the survey would find a high proportion of the residents of Lake, Ontonagon, Alger, Chippewa, and Osceola counties locked into poverty.

EMPLOYMENT CHANGES SINCE 1979

County earnings and income data for 1980 will be available early in 1982. Until then, employment statistics prepared by the Michigan Employment Security Commission offer the best clues on the decade's economic developments thus far.

During 1980, only sixteen Michigan labor markets experienced job gains over the 1979 level. Those are Alger, Ontonagon, Gogebic, Mecosta, Osceola, Houghton-Keweenaw, Dickinson, Delta, St. Joseph, and Grand Traverse–Kalkaska–Leelanau counties. The big losers were Montmorency, Arenac, Cass, Branch, and Crawford. Except for Crawford, which lost Bear Archery, its major employer, these five were affected by unemployment associated with declines in the manufacture of parts for motor vehicles.

March and April employment figures for 1981 show eighteen markets making job gains so far this year. They are Ontonagon, Delta, Montmorency, St. Joseph, Genesee-Shiawassee, Newaygo, Gratiot, Arenac, Gogebic, Saginaw, Baraga, Hillsdale, Kent-Ottawa, Lake, Ogemaw, Alpena, Clinton, Eaton, Ingham-Ionia, and Bay counties. When the May data are available, they will undoubtedly show job gains in several additional labor markets since there were sizable statewide employment gains following April's good showing. The big losers are Luce, Mackinac, Presque Isle, Missaukee-Wexford, and Montmorency. Luce County is experiencing declining state government employment, with spin-off effects on local merchants. In Mackinac County, state and local governments are declining with similar effects. Presque Isle suffers from declining local government employment plus layoffs in mining. (U.S. Steel takes limestone for its mills and for sale to cement manufacturers.) The data for the Missaukee-Wexford and Montmorency areas are affected by year-to-year changes in automotive related employment.

Linking the March-April 1980–1981 comparisons with those based on 1979–1980 averages yields the figures in Table 8. These show that Ontonagon County exhibited the highest rate of job growth since 1979. Copper Range, a mining company, expanded its activity by installing a refinery to remove silver from the copper produced there. Upper Peninsula Shipbuilding Company is a new enterprise that produces barges to carry freight across Lake Michigan. In Delta County, Mead Paper is expanding its mill. The gain in St. Joseph County resulted from two new General Motors Hydramatic plants in Constantine and Three Rivers. The services and retailing sectors provided the impetus in Gogebic County; manufacturing did so in Montcalm County. White Consolidated Industries, a major producer of large home appliances, has shifted some of its production to Greenville. Alger County enjoyed good growth between 1979 and 1980, but its main impetus was local government, a sector that has slipped somewhat since 1980. Houghton-Keweenaw had growth in services as well as state and local government between 1979 and 1980; however, state and local government employment had slipped in 1981. In Mecosta County, state government was responsible for 1979–1980 growth, and manufacturing is the cause of the poor 1980–1981 showing.

The state's most depressed economies are Montmorency, which has lost almost one-third of its job base since 1979, Luce, Mackinac, Branch, and Oscoda.

WHAT LIES AHEAD?

There are early indications that Michigan's economic recovery is stronger than had been predicted in the December issue of THE MICHIGAN STATE ECONOMIC RECORD. The Flint and Saginaw areas particularly should benefit, followed by Lansing and Bay City. Grand Rapids seems to have its own growth trajectory which was effected tangentially by the economic misfortunes of the automotive industry and the rest of the state. Battle Creek also has its own momentum, but less so than Grand Rapids. As automotive recovery gains momentum, the fortunes of Ann Arbor, Kalamazoo, Muskegon, and Detroit will improve. The economies of Jackson and Benton Harbor seem less resilient.

Reindustrialization of the motor vehicle industry has been slowed due to financial shortages. The original targets probably were unrealistic anyway because of a worldwide shortage of capacity to produce machinery for the new factories. In any case, by mid-decade Michigan is not likely to have as much automotive labor displaced by robots and other machines as most economists had been forecasting; but there also will be a delay in its gaining a competitive edge against Japanese imports. This represents a short-run gain at the expense of longer run viability enhancement, the short run being two years.

Very likely the state will use this breathing room, first to bring in specific new plants that are suited to its resource base, and second to manage its labor redundancy. Specific new factories might include one to manufacture small diesel engines for cars. There is a worldwide shortage of them. Two major producers of larger diesel engines are located here: Continental Teledyne in Muskegon and Detroit Diesel Allison near Detroit. However, prospects for Continental are uncertain after the Army stops buying M60 tanks for which it supplies engines. Perhaps Robert Bosch, world leader in electronic fuel injection, or some other company would be interested in a joint venture.

General Motors Corporation has announced its intention to install 14,000 robots in its factories by 1990. Perhaps GM will be persuaded to make robots in Flint, its own heaviest concentration of industrial activity.

The Detroit-Ann Arbor area hosts a burgeoning hospital-medical industry. There is a natural focus for medical electronics and manufacture of medical instrumentation.

Food processing is a target industry.

The Upper Peninsula has mineral and timber resources ready for exploitation. The only real constraint is electric power.

The northeast lower peninsula has vast unpopulated areas with geological formations ideally suited to storing nuclear waste and other toxic materials. The opportunities for industries that specialize in waste storage and detoxification are boundless.

Michigan's growth prospects are excellent, assuming that we have the imagination and ability to assemble the right packages or incentive for the right combinations of companies, particularly those that are already doing business here. Given that developmental entrepreneurship is the critical resource, and in short supply because it is a relatively young specialty, Michigan faces the likelihood of high unemployment notwithstanding favorable developments during the next two or three years. Perhaps the first order of business should be a study of unemployment and welfare clients with a view toward identifying remedies, such as intensive programs of retraining for jobs located in other states. After all, we in higher education have for decades facilitated the placement of more fortunate young people by providing them with credentials for jobs elsewhere.

TABLE 5

Michigan Counties Most and Least Dependent on Property Income in Total Personal Income: 1979

County	*Percentage*	*Per capita*
	Top 20	
Roscommon	25.8	$1,537
Leelanau	23.3	1,659
Montmorency	22.6	1,379
Alcona	22.2	1,297
Oscoda	21.0	925
Emmet	19.8	1,541
Crawford	19.5	1,107
Benzie	19.3	1,334
Antrim	19.0	1,293
Huron	18.3	1,444
Lake	17.3	987
Ogemaw	17.3	973
Keweenaw	16.8	989
Houghton	16.7	1,033
Cheboygan	16.6	1,096
Mackinac	16.7	1,046
Sanilac	16.4	1,171
Iosco	15.6	969
Presque Isle	15.4	960
Missaukee	15.2	825
	Bottom 10	
Muskegon	10.3	796
Ingham	10.2	982
Clinton	10.1	844
Shiawassee	9.9	840
Lapeer	9.7	768
Macomb	9.7	992
Wayne	9.7	985
Marquette	9.7	712
Genesee	9.6	941
Luce	8.9	668
Michigan	11.6	1,085
United States	14.1	1,235

SOURCE: Bureau of Economic Analysis, Regional Economics Information System.

TABLE 6

Michigan Counties Most and Least Dependent on Transfer Payments in Total Personal Income: 1979

County	*Per capita*	*Percentage*
	Top 20	
Lake	$1,819	31.9
Roscommon	1,887	31.7
Keweenaw	1,857	31.5
Oscoda	1,364	31.0
Montmorency	1,866	30.6
Alcona	1,752	29.8
Gogebic	1,845	27.8
Ontonagon	1,550	26.6
Chippewa	1,514	26.2
Ogemaw	1,465	26.0
Clare	1,523	25.6
Iron	1,624	25.2
Schoolcraft	1,642	25.1
Houghton	1,529	24.7
Crawford	1,296	22.8
Osceola	1,305	22.8
Alger	1,218	22.5
Arenac	1,415	21.9
Gladwin	1,315	21.9
Baraga	1,358	21.6
	Bottom 10	
Kalamazoo	967	10.3
Monroe	875	10.2
Eaton	804	9.2
Washtenaw	949	9.2
Ottawa	751	8.8
Clinton	701	8.4
Midland	777	8.1
Macomb	811	8.0
Livingston	629	7.9
Oakland	893	7.4
Michigan	1,097	11.7
United States	1,141	13.0

SOURCE: Bureau of Economic Analysis, Regional Economics Information System.

TABLE 7

Ranking of Michigan Counties According to Per Capita Personal Income: 1979

County	*Per capita personal income*	*Percentage change 1978 to 1979*	*County*	*Per capita personal income*	*Percentage change 1978 to 1979*
Oakland	12,058	9.86	Barry	7,132	11.75
Washtenaw	10,275	10.89	Leelanau	7,121	−0.47
Macomb	10,177	8.10	Manistee	7,100	11.86
Wayne	10,138	9.94	Montcalm	7,011	10.44
Genesee	9,790	9.59	Ionia	6,965	11.39
Ingham	9,632	12.09	Benzie	6,921	8.97
Midland	9,555	10.05	Mason	6,843	13.16
Kalamazoo	9,369	12.26	Antrim	6,825	10.83
Saginaw	9,221	10.31	Delta	6,654	12.91
Calhoun	9,174	11.15	Gogebic	6,642	11.65
Kent	9,011	13.10	Cheboygan	6,582	13.78
Gd. Traverse	8,843	9.88	Schoolcraft	6,527	17.01
Eaton	8,748	11.54	Menominee	6,525	10.54
Monroe	8,578	10.71	Oceana	6,498	10.34
Lenawee	8,555	12.99	Arenac	6,472	9.31
Ottawa	8,547	12.44	Iron	6,413	11.04

(Continued on page 8)

TABLE 7 (Cont.)

County	Per capita personal income	Percentage change 1978 to 1979	County	Per capita personal income	Percentage change 1978 to 1979
Jackson	8,519	11.04	Baraga	6,305	9.42
Dickinson	8,484	14.14	Presque Isle	6,262	13.63
Shiawassee	8,465	11.50	Newaygo	6,261	8.13
Bay	8,404	10.96	Isabella	6,254	10.45
Branch	8,367	12.64	Mackinac	6,252	12.83
Clinton	8,365	11.19	Iosco	6,205	10.51
St. Joseph	8,280	13.47	Houghton	6,201	12.42
Berrien	8,271	9.89	Montmorency	6,110	10.91
Cass	8,137	8.79	Gladwin	5,989	9.67
Tuscola	7,985	12.23	Roscommon	5,955	13.17
Livingston	7,966	6.25	Clare	5,943	12.07
Huron	7,901	14.47	Keweenaw	5,893	12.96
Gratiot	7,872	10.07	Alcona	5,869	14.67
Lapeer	7,872	7.81	Ontonagon	5,793	15.28
Emmet	7,791	11.84	Chippewa	5,787	13.25
St. Clair	7,770	7.65	Osceola	5,722	12.54
Muskegon	7,718	11.53	Lake	5,697	15.67
Hillsdale	7,664	15.18	Crawford	5,684	3.76
Luce	7,521	14.84	Ogemaw	5,613	16.45
Van Buren	7,499	10.87	Missaukee	5,427	11.69
Allegan	7,448	11.38	Alger	5,439	11.39
Marquette	7,382	9.85	Kalkaska	5,240	9.95
Otsego	7,336	11.59	Mecosta	5,159	11.09
Wexford	7,297	12.97	Oscoda	4,408	7.30
Charlevoix	7,292	12.11			
Alpena	7,201	10.82	Michigan	9,381	10.27
Sanilac	7,158	13.99	United States	8,757	11.61

SOURCE: Bureau of Economic Analysis, Regional Economics Information System.

TABLE 8

Percentage Change in the Number of Wage and Salary Jobs in Michigan Labor Markets: 1979–1981

Labor market	1979–1980	Mar. & Apr. 1980–Mar. & Apr. 1981	1970 to Mar. & Apr 1981
Ontonagon	+ 5.2	+ 7.0	+12.6
Delta	+ 1.1	+ 6.7	+ 7.9
St. Joseph	+ .9	+ 5.6	+ 6.6
Gogebic	+ 4.2	+ 2.2	+ 6.5
Montcalm	− 1.1	+ 5.9	+ 4.7
Alger	+ 5.4	− 1.0	+ 4.3
Kent, Ottawa	− 1.0	+ 1.6	+ .6
Newaygo	− 2.8	+ 3.3	+ .4
Houghton-Keweenaw	+ 2.5	− 2.2	+ .2
Alpena	− .7	+ .8	+ .1
Mecosta	+ 3.8	− 3.8	− .1
Gratiot	− 3.4	+ 3.2	− .3
Baraga	− 2.0	+ 1.6	− .4
Clinton-Eaton-Ingham-Ionia	− 1.7	+ .8	− .9
Osceola	+ 2.8	− 3.8	− 1.1
Isabella	− .2	− 1.2	− 1.4
Washtenaw	− 1.3	− .2	− 1.5
Roscommon	− 1.4	− .2	− 1.6
Grand Traverse–Kalkaska–Leelanau	+ .5	− 2.2	− 1.7
Allegan	− 1.8	− .4	− 2.2
Midland-Gladwin	− 3.2	− .6	− 3.8
Genesee-Shiawassee	− 7.3	+ 3.6	− 4.0
Kalamazoo–Van Buren	− 1.6	− 2.4	− 4.0
Bay	− 4.5	+ .4	− 4.1

TABLE 8 (Cont.)

Labor market	1979–1980	Mar. & Apr. Mar. & Apr. 1980–1981	1970 to Mar. & Apr. 1981
Muskegon-Oceana	− 3.2	− .9	− 4.1
Calhoun-Barry	− 3.6	− .6	− 4.2
Chippewa	− 3.4	− 1.0	− 4.4
Menominee	− 4.3	− .6	− 4.9
Saginaw	− 7.4	+ 1.8	− 5.7
Lake	− 7.3	+ 1.4	− 6.0
Hillsdale	− 7.8	+ 1.6	− 6.3
Lapeer, Livingston–Macomb–Oakland–St. Clair–Wayne	− 5.8	− .8	− 6.6
Alcona-Iosco	− 3.9	− 2.8	− 6.6
Dickinson	+ 1.5	− 8.2	− 6.8
Lenawee	− 6.9	− .2	− 7.1
Mason	− 1.5	− 5.8	− 7.2
Cheboygan	− 3.9	− 3.7	− 7.5
Jackson	− 6.0	− 1.8	− 7.7
Otsego	− 2.4	− 5.8	− 8.1
Tuscola	− 5.7	− 3.4	− 8.9
Ogemaw	−10.4	+ 1.2	− 9.3
Emmet	− 6.5	− 3.2	− 9.5
Iron	− 2.9	− 7.1	− 9.8
Benzie	− 2.7	− 7.4	− 9.9
Sanilac	− 6.7	− 3.4	− 9.9
Arenac	−12.7	+ 3.0	−10.1
Huron	− 7.3	− 3.4	−10.5
Berrien	− 5.9	− 5.4	−11.0
Schoolcraft	− 5.2	− 6.1	−11.0
Clare	− 6.4	− 5.0	−11.1
Missaukee-Wexford	− 2.7	− 9.2	−11.7
Charlevoix	− 9.1	− 3.6	−12.1
Marquette	− 5.8	− 7.0	−12.4
Manistee	− 4.3	− 8.6	−12.5
Cass	−11.9	− 1.0	−12.8
Antrim	− 5.4	− 8.8	−13.7
Crawford	−11.3	− 4.0	−14.8
Presque Isle	− 5.6	−10.0	−15.0
Oscoda	− 9.3	− 8.0	−16.6
Branch	−11.4	− 7.6	−18.1
Mackinac	− 7.4	−11.6	−18.1
Luce	− 3.3	−16.7	−19.4
Montmorency	−23.5	− 8.9	−30.3
Michigan	− 5.0	+ .2	− 4.8

SOURCE: Developed from Michigan Employment Security Commission, special release.

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